think-cell 7

User Manual

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Introduction

1. Product overview

Welcome to think-cell 7! This software is an add-in for Microsoft PowerPoint and Excel that is specifically designed to make the creation of business slides as fast as scribbling on paper. Slides created with think-cell intelligently arrange themselves to look just right. All the decorations – labels, connectors, arrows, and the like – are just a mouse click away, and are automatically placed precisely where they belong. The look of all drawings is optimized to fulfill the requirements of a clean and professional slide design.

2. Installation and update

This chapter guides you through the installation of your personal copy of think-cell. If you are about to prepare the deployment of think-cell in a larger organization, you should skip this chapter and read the Deployment guide on page 108.

System requirements

To install and run think-cell, the following software must be installed:

- Microsoft Windows Vista, 7, 8, 8.1, or 10
- Microsoft Office 2007 SP1, 2010, 2013, or 2016 with at least PowerPoint and Excel installed

The installation of think-cell requires about 80 MB of disk space.

First installation

Installing think-cell

Please close all instances of Microsoft PowerPoint and Microsoft Excel before installing think-cell.

The installation can be started directly from the online source. When you download the setup file you may choose the following:

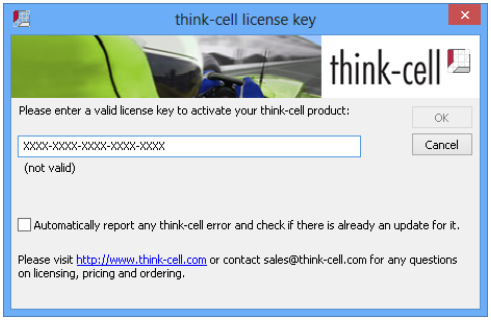
- **Open** in order to install the software directly from the internet.
- **Save to Disk** and start the installation by double-clicking the downloaded setup file.

The installation wizard asks for the installation path, then copies the required files and updates the registry. If the installation wizard detects that you do not have sufficient privileges for a regular installation, a single-user installation will be performed. This means that think-cell can only be used with your current Windows login name.

think-cell uses the same language as in the menus and dialogs of your installation of Microsoft Office, provided that it is supported by think-cell (see Language on page 110 for more details). If it is not yet supported, English is used.

Entering the license key

The public version of think-cell requires a valid license key, which expires after a fixed period of time. When you start PowerPoint with a think-cell trial version for the first time, or when your license key has expired, you need to enter a valid license key.


think-cell license key
think-cell
Please enter a valid license key to activate your think-cell product:
OK
XXXX-XXXX-XXXX-XXXX-XXXX
Cancel
(not valid)
Automatically report any think-cell error and check if there is already an update for it.
Please visit http://www.think-cell.com or contact sales@think-cell.com for any questions on licensing, pricing and ordering.

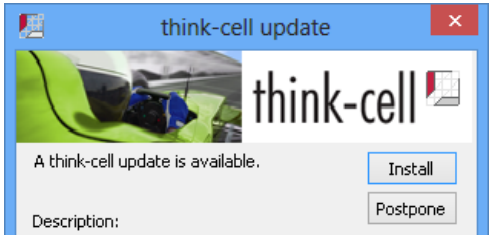
Please contact us to receive such a license key for the first time or as a prolongation of your existing deployment. In any case, you can always click the **Cancel** button and continue using PowerPoint without think-cell. To enter the license key later, click the **Activate think-cell** button in the think-cell toolbar or ribbon group.

Automatic update

think-cell regularly checks online to see if a new release is available, and if so, attempts to download the updated installation file. The automatic download is subject to the following conditions:

- The check for a new release is performed once when PowerPoint is started with think-cell installed and enabled.
- The automatic download runs quietly in the background and only occupies unused bandwidth. If the internet connection is interrupted or there is other network traffic, the download is paused until the network is again available.
- While PowerPoint is in on-screen presentation mode, any automatic update activities are suppressed.

A dialog box appears after the download is completed, indicating that a new release of think-cell is available for installation. You have the option to either immediately **Install** the update, or click **Postpone** to postpone the installation until the next start of PowerPoint.



Security note: All files that are executed and installed by the automatic update are digitally signed by think-cell. The integrity of the update is verified against a self-signed certificate that is included in the version of think-cell currently installed. This is more secure than the usual procedure of verifying the update against a certificate issued by a certificate authority. In particular, two types of attack are avoided: First, certificate authorities may be subject to impostor attacks, e.g., a third party obtaining a fraudulent certificate from a trusted certificate authority by pretending to be think-cell. Second, Microsoft's Automatic Root Certificates Update can silently install new trusted root certificates on demand. By these means, Microsoft may introduce new root certificates which are not subject to public scrutiny, but which are used by Windows to establish trust.

Trouble shooting

For latest information on known issues and workarounds, please refer to our website at:

https://www.think-cell.com/kb

If you cannot find a solution in the knowledge base or this manual, feel free to contact our support team. Open the **More** menu in the think-cell tool bar and click on **Request Support**... Choose from the opening window whether you would like to attach certain slides to an e-mail to think-cell's support team. This is often useful to point up a problem. After confirming with **OK** your e-mail application will open with an e-mail template.

Online quality assurance

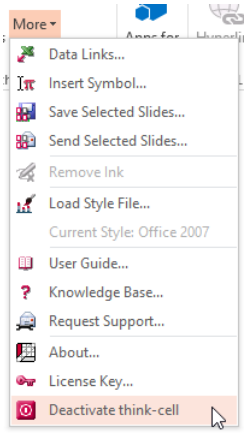
At think-cell we are committed to stability and robustness as key factors for the professional use of our software. When an error condition arises while you are using think-cell, the software automatically generates a report that helps us to understand the problem and fix it in the next release. The error report only contains information about the internal state of our software. No user data is included in the error report.

The software sends the error report encrypted. You might notice a short delay while an error report is being sent, but in most cases you can continue using think-cell as usual.

For more information on think-cell's automated error reporting, refer to section Online quality assurance on page 116.

Temporarily disabling think-cell

To quickly work around compatibility problems, or other issues arising from the use of think-cell, you have the option to temporarily disable think-cell without uninstalling the software.



In the **More** menu in the think-cell toolbar in PowerPoint, there is an option called **Deactivate think-cell**. When you select this option, think-cell will be disabled immediately. With think-cell disabled, charts are presented as normal PowerPoint shapes. To re-enable think-cell, click the **Activate think-cell** button in the think-cell toolbar or ribbon group in PowerPoint. There is no need to close the PowerPoint application in order to switch between think-cell and plain PowerPoint.

Before you alter think-cell elements without think-cell, be aware of potential compatibility issues (chapter Exchanging files with PowerPoint on page 119).

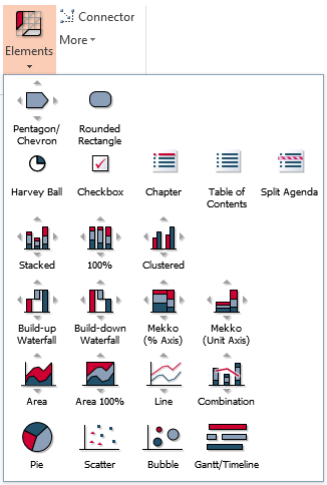
Note: You do not need to disable think-cell in order to make your presentations accessible to coworkers or clients who may not have think-cell installed. Simply send them the same file you are working with – if think-cell is not installed, they will find a presentation with normal PowerPoint shapes.

3. Basic concepts

This chapter presents the basic concepts that apply to working with all think-cell elements.

Toolbar and Elements menu

After installing think-cell you will find the following group in the **Insert** tab of the ribbon in PowerPoint:



In the following, we will refer to the ribbon group by the term *think-cell toolbar*. Using the think-cell toolbar you can call most of think-cell's functions.

Note: We will also uniformly use the term *Elements button* to refer to the button **Elements** in PowerPoint, and the button **Charts** in Excel.

After clicking on the **Elements** button, the symbols in the first two rows represent basic elements (see Basic elements on page 79) and agenda slides (see Agenda on page 81), while the other rows represent chart types (see Introduction to charting on page 24).

The following elements are available:

Icon	Known as	Page
	column or bar chart	38
	100% column or bar chart	39
	clustered column or bar chart	38
	build-up waterfall chart	54
	build-down waterfall chart	54
	Mekko chart with units	58
	Mekko chart with %-axis	58
	area chart	41
	area chart with %-axis	41
	line chart	39
	combination chart	41
	pie chart	61
	scatter chart	63
	bubble chart	64
	project timeline or Gantt chart	66
	table of contents	83
	chapter	81
	split agenda	83
	pentagon/chevron	79
	rounded rectangle	79
	Harvey ball	79
	checkbox	79

Furthermore there are universal connectors to connect the elements (see Universal connectors on page 52 for more information).

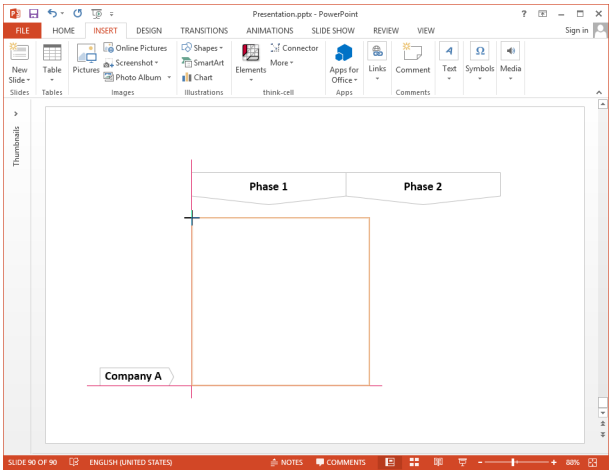
And finally **More** offers additional valuable tools (see Presentation tools on page 86) to facilitate your daily work with PowerPoint.

Inserting elements

Inserting an element into your presentation is very similar to inserting a PowerPoint shape. To create a new element on a slide, go to the think-cell toolbar and click the **Elements** button. Then, select the required element. You may notice small arrow markers around some of the elements. Moving the mouse over these markers lets you select rotated and flipped versions of these elements.

If you unintendedly have selected some element, you can always do the following:

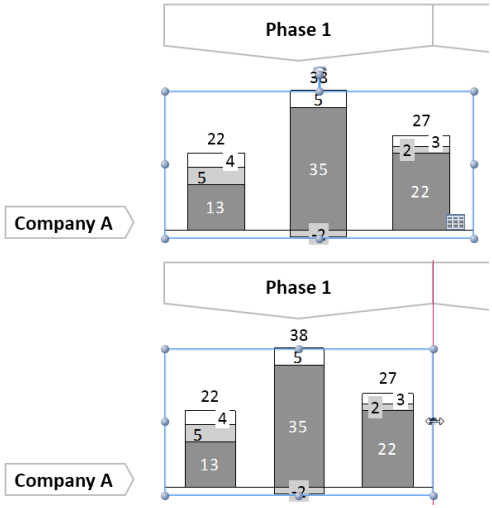
- Press the Esc key to cancel the insert operation.
- Re-click the **Elements** button to select a different element.



Once you have chosen an element, a rectangle will appear with the mouse pointer, indicating where the element will be inserted on the slide. You have two options when placing the element on the slide:

- Click the left mouse button once to place the element with the default width and height.
- Hold down the left mouse button and drag the mouse to create a custom-sized element. Some elements have a fixed width for insertion; in this case, you can only alter the height. You can always change the size of the element later.

When you are inserting or resizing an element, you will notice that it snaps to certain locations.



The snapping behavior serves the following purposes:

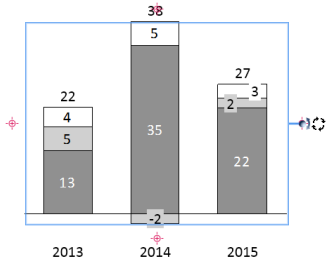
- With snapping, objects can be quickly and easily aligned. The highlighting of a border of some other object on the slide indicates that the element you are moving is currently aligned with that object.
- When resized, some elements snap to an automatically determined and predefined preferred size. In the case of a column chart, for example, its preferred width depends on the number of columns. If you have manually changed the size of an element, you can easily change it back to the default width. It will snap when you come close enough to the default while adjusting the width with the mouse.

As in PowerPoint, you can hold down the Alt key to move the mouse freely without snapping.

Rotating and flipping elements

The small arrow markers around the pentagon/chevron and the stacked, clustered, 100%, line, area, waterfall and Mekko chart symbols in the **Elements** menu let you insert flipped (and – if applicable – rotated) versions of these elements.

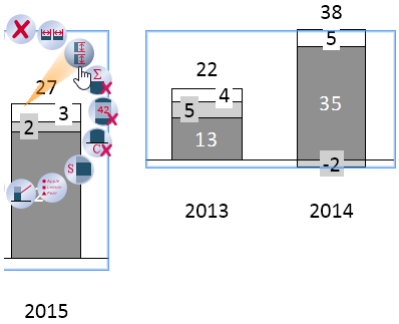
Most elements can also be rotated after insertion using a rotation handle. Simply select the element and drag the rotation handle to the desired position: Click with the left mouse button on the rotation handle and, while holding the button down, drag the handle to one of the four possible red-highlighted positions and release the button.



Resizing elements

When an element is selected, resize handles are shown at the corners and in the center of the boundary lines. To resize an element, drag one of these handles.

You can also set two or more elements to the same width or height. This also works if you include PowerPoint shapes in your selection. First, select all objects that you want to set to the same width or height (see Multi-selection on the next page). Then, choose **Same Height** or **Same Width** from the context menu of an element included in the selection. All objects will be resized to the same height or width, respectively.



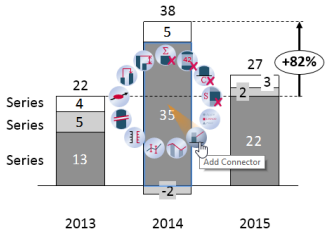
The height or width of all elements is set to the largest height or width among the individual elements.

Selecting elements and features

think-cell's elements often contain individually selectable parts that we call *features*. For example, a chart element consists of the segments corresponding to the values in the datasheet and may also contain labels, axes, difference arrows, connectors and so forth.

You can distinguish a feature by the orange frame that appears when the mouse pointer is over it. When you click it, the frame turns blue to mark it as the currently selected feature. Additionally a floating toolbar might appear. It contains a set of property controls you can use to give the feature a different look. It is a good idea to explore a newly-inserted element to get an overview of the features it is made of and their properties.

When you right-click on a feature, its context menu appears. You use it to add additional features to the element or remove those currently visible.



Buttons whose functions are unavailable for the current selection are greyed out. The context-menu of the entire element is invoked by right-clicking the background of the element.

Features always belong to their respective elements and can themselves have further features. As an example, the vertical axis of a line chart is a feature of the chart itself, while the tickmarks along the axis are features of the axis. Consequently you use the chart's context menu to switch on or off the vertical axis and the axis' context menu to toggle whether tickmarks are shown.

There are several ways to remove a feature:

- Left-click the feature to select it and press the Delete or ⟵ key on your keyboard.
- Right-click the feature to open the think-cell context menu. Click the **Delete** button to remove the feature from the element.
- Open the think-cell context menu that you used to add the feature. Click the same button again to remove it.

Note: You cannot remove data segments from a chart element in this way. All data segments shown are controlled by the internal data sheet. If you delete a cell from the internal datasheet, the corresponding data segment is removed from the chart element.

Note: Buttons which toggle the presence of a feature, e.g. if series labels are shown in a chart or not, change their state accordingly. For example, after you have chosen **Add Series Label** to add series labels to a chart element, the button changes to **Remove Series Label**. In the following, generally only the state of the button for adding the feature is shown.

Detailed information on all the available features is provided in the following chapters accompanying the respective elements they apply to.

Multi-selection

You can quickly select a range of features that belong together – this is called *logical multi-selection*. It works the same way as with files in Microsoft Windows Explorer: Select the first feature in the desired range with a single left mouse button click, then hold down Shift ⇧ and click the last feature in the range. When you move the mouse while holding down Shift ⇧, the range of features that is going to be selected is highlighted in orange.

To add single features to the selection, or to remove single features from the selection, hold down Ctrl while clicking. Again, this is the same way multi-selecting files works in Microsoft Windows Explorer.

Using the keyboard to select a complete range is also possible. Select a feature with a single left mouse button click and press Ctrl+A. All features that could have been included in a range together with the selected feature are selected as well.

Logical multi-selection is particularly useful if you want to colorize an entire data series in a chart element, or if you want to change the formatting of a range of labels. You can even use multi-selection to paste text into multiple

labels at once (see Pasting text into multiple labels on page 36).

Keyboard navigation

In many cases, you do not need the mouse to select other objects on a slide. Instead, you can hold down the Alt key and use the cursor arrow keys ← → ↑ ↓ to select another object.

- When a PowerPoint shape or think-cell element is selected, Alt with cursor keys selects the next shape that is found in the arrow's direction.
- When an element's feature is selected, Alt with cursor keys selects the next feature of the same kind in the element.

However, you can only shift the focus to features of the same element. Use the mouse again to select a feature of another element.

Panning

When editing a slide in a zoomed view (like 400%) it is often hard to move the slide around and locate the region that you want to work with next. With think-cell installed, you can use the middle mouse button to "pan" the slide: Just grab the slide with your mouse pointer by clicking the middle mouse button and move it where you need it.

If your mouse has a wheel instead of a middle button, you can achieve the same effect by pressing down the wheel without turning it.

Note: You probably know that in PowerPoint you can zoom in and out using the mouse wheel with the Ctrl key held down. Together with the panning feature from think-cell, using zoomed views for slide design becomes easy and fast.

Formatting and style

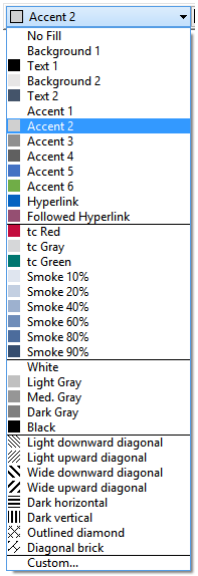
When you select an element or feature by clicking on it a *floating toolbar* might appear. It contains property controls to change the look of the feature. Only the controls which are applicable to the selected feature are shown in the floating toolbar.

In this chapter several general types of controls are described. Through the course of the following chapters, detailed information is provided for all property controls of the floating toolbar in the context of specific element and feature types.

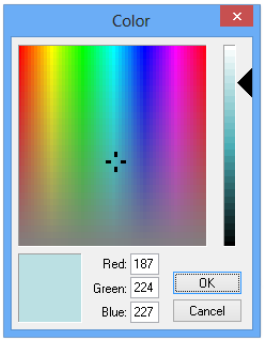
Color and fill

The color control applies to features that have a fill color and to lines in line charts. It does not apply to text, because the text color and the text background color are always set automatically.

The list contains **Like Excel Cell** if you have enabled **Use Excel Fill** in the color scheme control (see Color scheme on the next page). To reset the fill color of a segment you colored manually choose **Like Excel Cell** to use Excel's cell formatting.



If you need other colors than offered by the color control, select the **Custom** option from the dropdown box. You will then be presented with a color picker where you can choose any color you like.

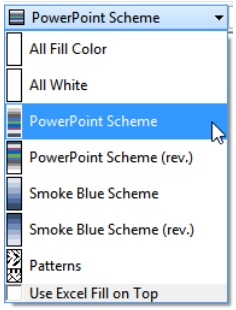


Note: If you want to apply a color other than black or white, make sure that the slider for the brightness (on the very right of the dialog) is not set to minimum or maximum. When you move the slider up or down, you can watch how the color changes in the colored field on the bottom of the dialog.

think-cell adds the most recently used custom colors to the color control for quick access. You will find a divider line in the list of most recently used colors: The colors above the divider are saved within the presentation, so you can rest assured that your colleagues have them available when editing the presentation. The colors below the divider are available on your computer only, because you were using them in a different presentation. Both sections can hold up to 8 colors. When you use a 9th custom color, the first one is removed from the list.

You should use the color property when highlighting specific segments or one series in a chart. If you need to colorize an entire chart, use the color scheme property instead.

Color scheme



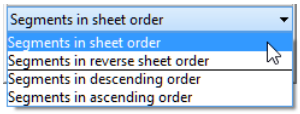
The color scheme control applies consistent coloring to all segments of a chart, so the first series uses the first color in the color scheme, the second series the second color and so on. The coloring is automatically updated when a series is added or removed. See section Changing default colors and fonts on page 22 for more information.

When you check **Use Excel Fill** think-cell applies the color from Excel's cell formatting to the chart in PowerPoint. This is particularly convenient if you want to control the chart colors through your Excel data source in the case of a linked chart. For instance the **Conditional Formatting** can help you to color positive values green and negative values red.

If you have enabled **Use Excel fill** and the cell corresponding to a data segment does not have a fill color set as part of Excel's cell formatting, then the appropriate color from the current color scheme is applied, i.e. the Excel fill color is applied on top of the color scheme.

Note: Using Excel's cell formatting to set a segment's fill color does not work if you use conditional formatting rules in Excel and these rules contain functions or references to other cells.

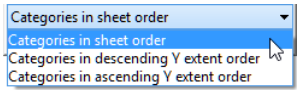
Segment sorting


Segments in sheet order
Segments in sheet order
Segments in reverse sheet order
Segments in descending order
Segments in ascending order

The segment sorting control applies a specific order to the segments in a chart. The default **Segments in sheet order** orders segments in the same order they appear in the datasheet. If you choose **Segments in reverse sheet order** the last series in the datasheet will be displayed at the top of the chart and the first series in the datasheet at the bottom of the chart.

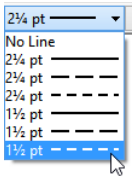
think-cell can also sort the segments in a category based on their value. **Segments in descending order** will sort all categories so that the largest segment in each category is on the baseline and sort the other segments in descending order, **Segments in ascending order** will display the segment with the smallest numerical value on the baseline. As a consequence of sorting, segments of the same data series, with the same color, will appear at different positions in different categories.

Category sorting


Categories in sheet order
Categories in sheet order
Categories in descending Y extent order
Categories in ascending Y extent order

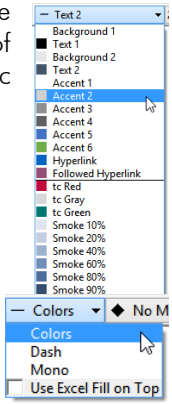
The category sorting control applies a specific order to the categories in a chart. The default **Categories in sheet order** orders categories in the same order they appear in the datasheet. **Categories in descending Y extent order** will show the category with the greatest sum of values first and then sort in descending order. **Categories in ascending Y extent order** will show the category with the smallest sum of values first and then sort in ascending order.

Line style



The line style control applies to the outlines of segments of column, bar and pie charts, basic elements, agenda chapters, lines in line charts, a chart's baseline and to value lines (see Value line on page 51). You can also change a connector's appearance using the line style control. In addition, the outline of the plot-area in all charts can be specified using the line style control.

Outline colors

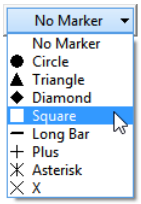


You can change the color of an outline with this control. It works for segments of column, bar and pie charts as well basic elements and agenda chapters.

Line scheme

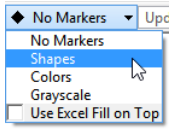
The line scheme control specifies the appearance of lines in line charts. The supported line schemes apply consistent line styles and coloring to all lines in the chart.

Marker shape



The marker shape control can be used to add or change markers for data points in line and scatter charts. Note that the marker scheme control should be used instead of marker shapes to add consistent markers to all the data points in a line or scatter chart.

Marker scheme



The marker scheme control applies consistent markers to data points in scatter or line charts. The markers are automatically updated when data points, groups and series are added or removed. The marker scheme control should be preferred over the marker shape control when adding consistent markers to an entire line or scatter chart.

Changing default colors and fonts

think-cell can use PowerPoint's scheme colors for many elements and features (e.g. axes, text, arrows, etc.). These colors as well as font definitions are always taken from the default colors and fonts of your presentation file. If the defaults are designed correctly, think-cell will follow seamlessly when you choose to switch the color scheme.

To adjust the default font settings, simply change your presentation's slide master:

1. In the ribbon, go to **View**.
2. In the group **Master Views**, click on **Slide Master**.
3. In the left pane showing the slide master and the different layouts with indentation, select the slide master. Please note that when opening the slide master view the layout type of the current slide is selected, so you need to scroll to the top and select the non-indented slide master instead.
4. Adjust the fonts of the body text placeholder to match your corporate design.

To adjust the default color settings, simply change your presentation's color scheme:

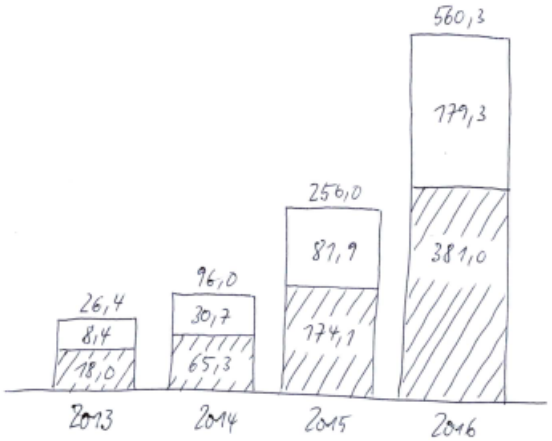
1. In the ribbon, go to **Design**.
2. In the group **Themes**, click on **Colors**.
3. From the drop-down list choose **Create New Theme Colors**...
4. Adjust the colors to match your corporate design.

In general, it is advisable to store these defaults in a PowerPoint template file (*.potx) and to derive all new presentations from this template file. Please refer to the PowerPoint help for information on how to do this.

Charting

4. Introduction to charting

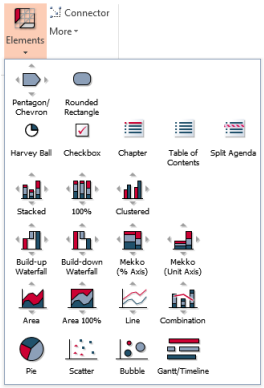
In this chapter, a step-by-step tutorial will show you how to create a chart from a scribble like this:



A more elaborate presentation of the basic concepts of think-cell and details on the various chart types can be found in Basic concepts on page 14 and in the following chapters.

Inserting a new chart

With think-cell installed, you will find the following group in the **Insert** tab of PowerPoint's ribbon.

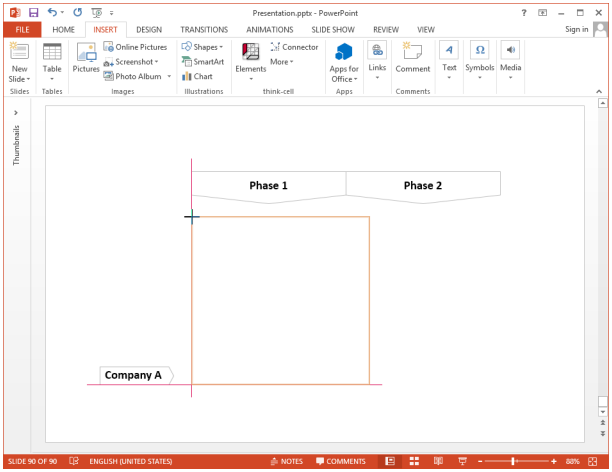


Inserting a chart into your presentation is very similar to inserting a PowerPoint shape. Go to the think-cell group

and click the **Elements** button. Then, select the required chart type.

In our example, we want to insert a column chart, which is represented by this button:

Once you have chosen a chart type, a rectangle will appear with the mouse pointer, indicating where the chart will be inserted on the slide. When you are inserting or resizing a chart, you will notice that it snaps to certain locations, aligning with existing objects on the slide.

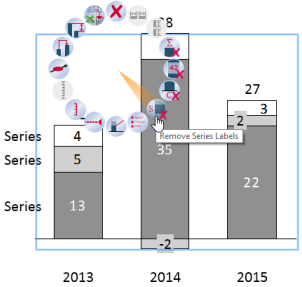


The chart is automatically selected after insertion, as indicated by a blue highlighted outline. If a chart you want to modify is not selected, you can select it by clicking on it.

Adding and removing labels

After inserting a new column chart, both category labels and series labels are shown automatically. There are several ways to remove and add labels. The easiest way to remove a single label is to select it and press the Delete key. The easiest way to remove all labels of a particular type is to select the respective button from the chart's context menu.

To remove the series label like in our example column chart, click **Remove Series Label** in the chart's context menu. To access the context menu of a chart, move the mouse to a point within the chart's rectangle where there are no other objects and click the right mouse button. Read more about editing text labels in the chapter Text labels on page 32.



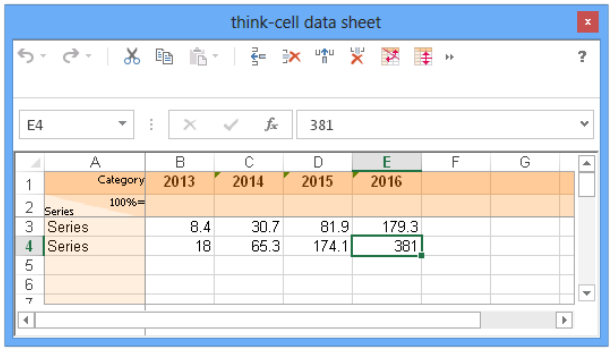
Entering chart data

When you select the column chart, a datasheet button **Open Datasheet** is displayed in the bottom right corner of the chart.

Click the datasheet button, or simply double-click the chart, to open the datasheet. The datasheet opens automatically after insertion of a new chart. Now, enter the data from our example column chart into the datasheet. Type in only the actual numbers. Do not round numbers or calculate totals – think-cell will do this for you. For most chart types, you can simply input the numbers the

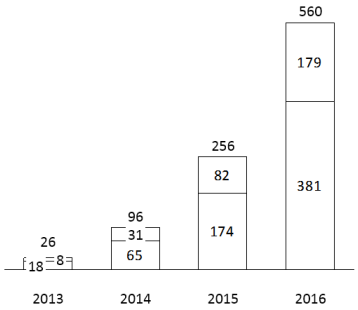
way you see them in the scribble, from left to right and from top to bottom. The tab key ⇆ can be used, just as in Microsoft Excel, to conveniently move to the next column in a row, and the enter key ↵ can be used to jump to the first column of the next row.

The datasheet for our example column chart looks like this:



Note that the chart on the slide instantly updates to reflect the changes in the datasheet. It even grows and shrinks depending on the area of the datasheet that you use. Years are automatically inserted as category labels in the first row of the datasheet. The sequence of years is automatically continued when you start entering data in the following column.

Having entered the data, our example chart looks like this:



As you can see, think-cell has already performed a good deal of work to make the chart look "right." In particular, it automatically placed all labels and added column totals. The next section explains the last few steps to finish our example chart.

Styling the chart

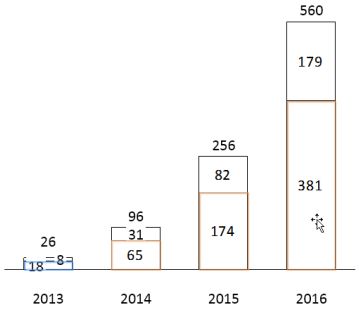
Every chart element consists of a number of *features*. In our example, text labels and column segments are the most important features of the column chart. Each kind of feature has a number of specific properties that you can change in order to give it a different look. To change a feature's properties, you have to select it first. You can also select multiple features at a time to change their properties together.

Selecting features is very similar to selecting files in the Windows Explorer:

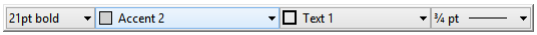
- Select a single feature by clicking on it with the left mouse button.
- Or select multiple features by holding down the Ctrl key while clicking.
- You can also select a contiguous range of features by holding down the Shift ⇧ key, moving the mouse

pointer and then clicking with the mouse. Watch how the affected features highlight while you move the mouse with the Shift ⇧ key held down.

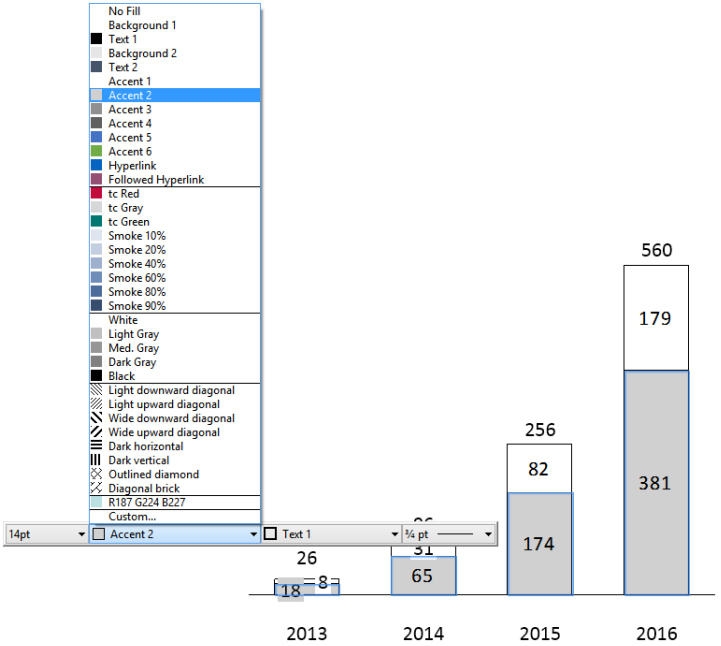
The following screenshot shows how all column segments of the second data series highlight in orange while they are collectively selected in a Shift ⇧-click operation:



When you select features, a floating toolbar containing the corresponding property controls will appear. For the selection of column segments as illustrated above, for example, the **Fill Color** control becomes available in the toolbar:

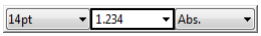


In our example, we want to change the shading of the second data series, as required by the scribble on page 24. Therefore, after selecting the column segments of the series, we choose **Accent 2** shading:



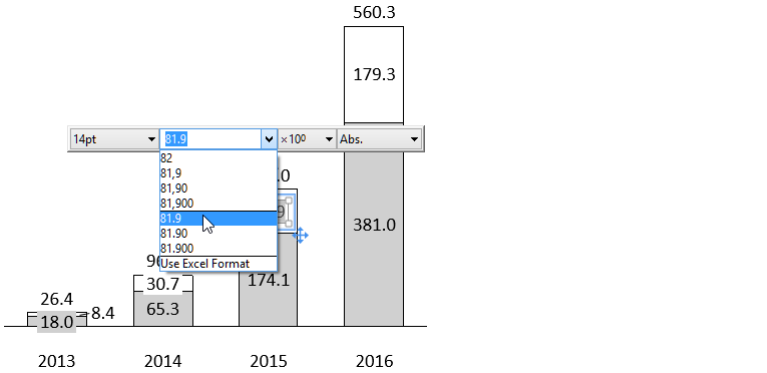
Note that the labels automatically turn white to make them easier to read on the dark background.

Finally, the numbers in our example chart are still displayed with incorrect precision. According to the scribble, they should be rendered with one decimal place precision. We simply have to select one of the segment labels, and the floating toolbar changes to include the **Number Format** control:



By typing the decimal place into the number format box, you can specify the desired display format and it will be applied to all numbers of the same type in the chart. Alternatively you can click on the arrow and select the

desired format from the drop down box. Note that the actual numbers you type or select do not matter, they only act as an example of the required formatting (read more in section Number format on page 35).



The scribble on page 24 is now represented by a clear, professional looking chart. As you become familiar with using think-cell, you will be able to create a chart like this in less than one minute.

5. Data entry

Internal datasheet

Every chart created with think-cell has an associated datasheet, except for the Gantt Chart, that offers a calendar instead. The datasheet is opened by double-clicking the chart or by clicking the **Open Datasheet** button that appears when the chart is selected. The data sheet also opens immediately when a new chart is inserted.

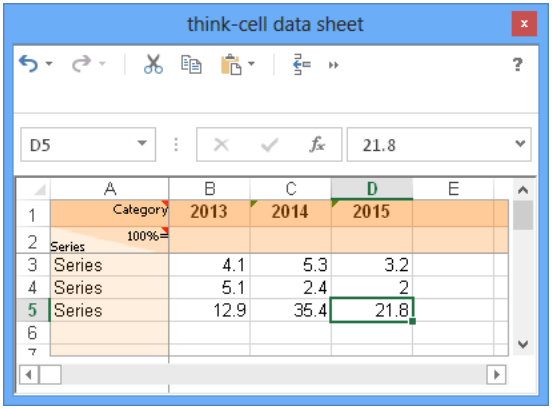
think-cell uses a customized Microsoft Excel sheet for data input, which you can use in the same way as regular Excel. You can use all the same shortcut keys, you can enter formulas instead of numbers, and so forth. But of course you can also use an Excel file as a data source (see Excel data links on page 90).

To insert or delete a row (or column) you can use the respective buttons in the toolbar of the datasheet. The standard buttons for undo and redo and cut, copy and paste are available as well.

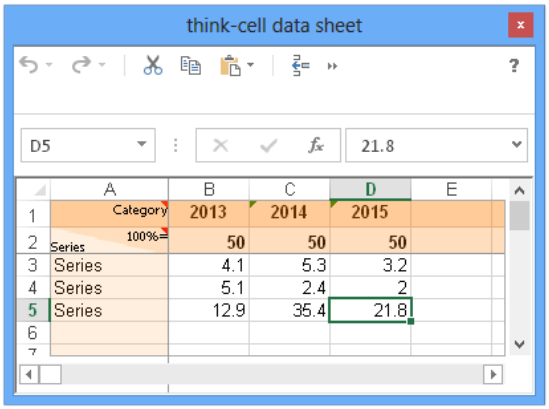
Absolute and relative values

The think-cell datasheet alternatively supports entry of absolute or relative values. The distinction between the two types of data is made by the Excel cell formatting. You can always toggle the interpretation of a column's data with the % button.

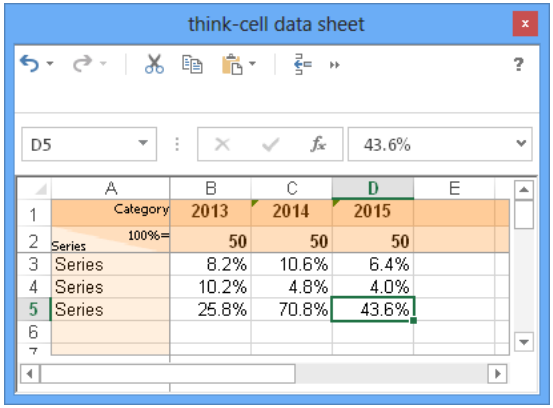
Keep in mind that for the display in the chart, it does not matter if you enter percentages or absolute values. If you enter absolute values but want to label the chart with percentages (or vice versa), think-cell performs the necessary conversion (see Label content on page 36). A simple datasheet with only absolute values looks like this:



For simple charts based on absolute values only, the **100%** row on top of the chart data can be left empty. If you choose to label the chart with percentages, the percentages are calculated from the absolute values, assuming the sum of each column to be "100%". You can enter explicit values in the "100%" row to override this assumption. The following datasheet calculates percentages based on 100% being equal to a value of 50:



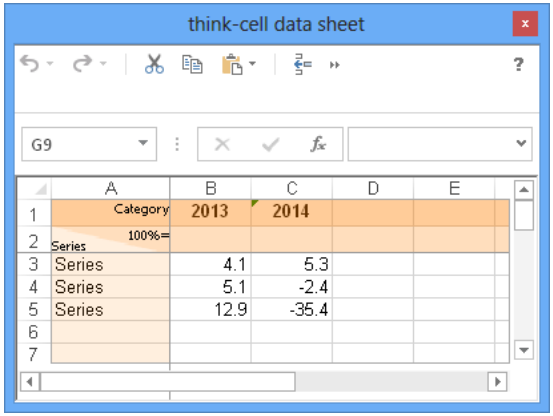
Alternatively, you can fill in the datasheet with percentages. Again, you can choose to label the chart with absolute or relative values. In order to have think-cell calculate absolute values from the percentages you entered, you should fill in the absolute values that represent 100% in the **100%** row. The following datasheet uses percentages to specify the same data values:



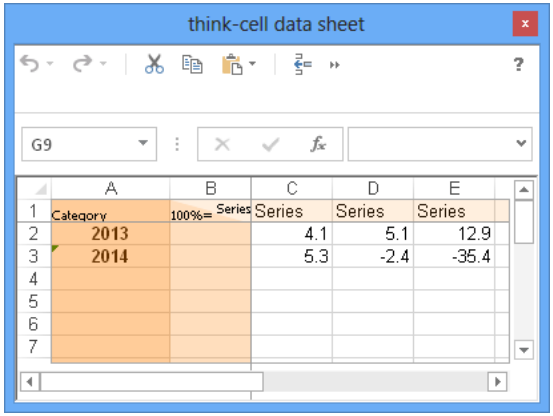
The default behavior of the datasheet depends on the chart type: 100%-charts and area or Mekko charts with %-axis as well as pie charts default to percentages, while all other charts default to absolute values.

Transposing the datasheet

The layout of a think-cell datasheet depends on the chart type. In bar charts, for example, columns contain the data for a single series, while in column charts, rows contain the data for a single series. Here is a typical datasheet for a column chart:



The size of a think-cell datasheet is limited to a maximum of 256 columns and 65536 rows. If the data for your chart requires more than 256 columns, you can use the **Transpose Sheet** button to transpose the datasheet, swapping the row and column data together with any category/series interpretation. Here is the transposed version of the previous column chart datasheet:



Transposing the datasheet lets you create charts where the datasheet would normally require more than 256 columns, and can often be used to simplify data entry when working with a large amount of data.

Note: The limitation of the number of rows and colums is due to the same limitation of Excel datasheets in general in Excel 2003. For compatibility reasons, the limitation also applies when using Office 2007 or later.

Reverse order in datasheet

In think-cell, the visual order of data in the datasheet always corresponds to the order of the data in the chart. This is also true for flipped charts (see Rotating and flipping elements on page 17). If you want to flip the data in the datasheet, you can use the **Flip Rows** (or **Flip Columns**) button in the datasheet's toolbar.

Note: This function is particularly convenient to convert data from former MS Graph charts, because in MS Graph data is entered in headfirst order.

Note: If you have Microsoft's Chinese Conversion feature installed, you will find the options **Simplified Chinese** and **Traditional Chinese** in the datasheet's **More** menu.

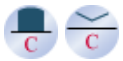
6. Text labels

think-cell takes care of correct and readable labeling. Avoid using PowerPoint text boxes to label your charts as they will be ignored by think-cell's automatic label placement. When you create labels from think-cell's context menu, the default content is taken from the datasheet or calculated by the program (in the case of column totals, averages, and the like).

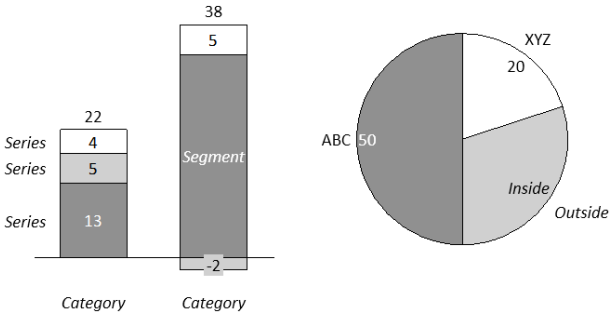
In addition, you can always enter additional text or replace the default text inside think-cell's automatic labels. When a label is selected, you can start typing, overwriting the current text. If you want to keep the existing text, enter text editing mode by pressing F2 and use the cursor keys and Home/End keys to navigate within the label text. This section explains how think-cell's labels work in detail.

Types of labels

Here is a list of labels that are supported for different types of charts, and the buttons in the context menu to add or remove them:

Label type	Chart types	Menu buttons
Category	column/line/area	
Series	column/line/area	
Segment	column	
Point	line/area	
Total	column/area	
Inside	pie	
Outside	pie	
Activity	Gantt	
Item	Gantt	
Scale	Gantt	

Note: Column includes stacked chart, clustered chart, 100% chart, Mekko chart, waterfall chart, and their rotated variations



Automatic label placement

When using think-cell, labels are automatically placed at their appropriate positions. A number of built-in rules ensures that labels are always placed for easy readability and pleasant aesthetics. These rules are specific to the chart type and to the type of the label in question. Here are some examples.

For segment labels in column charts:

- If there is enough space, place all labels centered.
- If a label is larger than the segment it belongs to, put a colored rectangle underneath the label.
- If two labels are too close together, offset one to the left and the other to the right.
- If there is not enough space inside a segment, place the label outside the segment and add a line that points to the related segment.

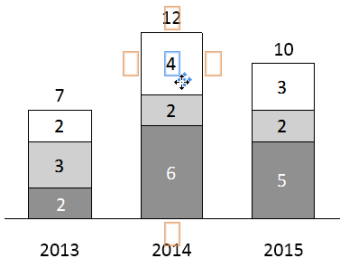
For inside labels in pie charts:

- If there is enough space, place them as close to the segment's outside border as possible.
- If a label is larger than the segment it belongs to, put a colored rectangle underneath the label.
- If two labels are too close together, offset one of them towards the center of the pie.

Manual label placement

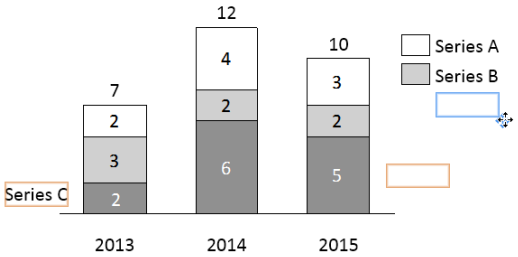
In general, think-cell automatically places all labels at appropriate positions. If a label can be placed at multiple positions, you can manually change think-cell's placement decision:

1. Select the label. If a drag icon appears at the lower right corner of the selection then this indicates that there are alternative locations for the label.
2. Drag the selection frame or the drag icon with the mouse. While you are dragging, available locations highlight, and the blue selection frame jumps to these locations.
3. Drop the label at the desired location.



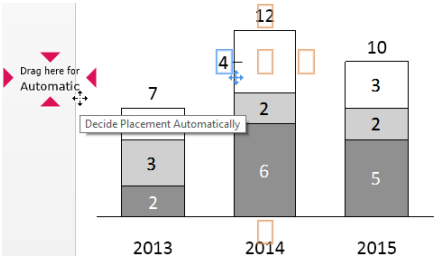
Labels that do not show the drag icon when selected, do not offer alternative locations.

When manually placing a series label, alternative locations for the label will include any existing legend (Legend on page 53) for the chart.



Once you have manually placed a label at a specific position, think-cell will respect your decision and maintain the label's position even when the chart layout changes.

If you want a manually placed segment label to be put back into automatic mode, drag the mouse pointer onto the target **Drag here for Automatic** or click the **Enable Automatic Placement** button from the label's context menu.



Note: You can also drag multiple labels at the same time. To do so, use multi-selection (Multi-selection on page 18) and move one of the selected labels as a representative.

Label rotation

Many labels can be rotated by 90 degrees counterclockwise or clockwise. To rotate a label, select it and drag the rotation handle to the desired position. Labels that do not show the rotation handle when selected cannot be rotated.

Note: You can also rotate multiple labels at the same time. To do so, use multi-selection (Multi-selection on page 18) and rotate one of the selected labels as a representative.

Text fields

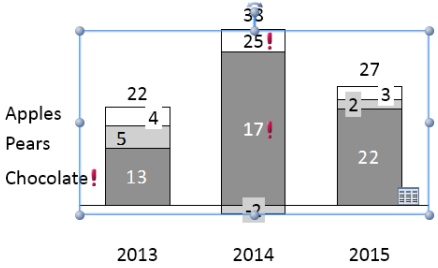
You can add arbitrary text to all labels that are created with think-cell. The numbers in the labels are updated whenever the datasheet changes, even when the label contains extra text. This is particularly convenient for annotations or footnote marks. To use this function, simply type into the text box as usual.

When you move the cursor or select text, you will notice that the numbers from the datasheet behave like a single character. This concept is called a *text field*. You can either overwrite the text field or add text before or after it, but you cannot change it. Any numbers that are based on the datasheet and are displayed in chart labels, are created as text fields. Each text field refers to a certain number created from the Excel data. This could be a single cell in the datasheet or a calculation involving multiple cells. Whenever the data source of the text field is changed, the numbers in the label are updated to reflect the change.

As long as you do not delete or overwrite a label's text field, the numbers in the text box are kept consistent with the numbers in the datasheet. You may, however, choose to delete the field and replace it with some other

text or numbers. In this case, the text in the label will no longer be updated.

It is not obvious when a numeric text field has been overwritten with some other number. To inform you that the label is no longer automatically updated, an exclamation mark ❗ pops up next to the label. The exclamation mark also pops up next to category or series labels if you entered text in the datasheet but then replaced the text field with custom text. Note that the exclamation mark is purely informative and that overwriting text fields is often perfectly legitimate.



To reset a label and (re-)insert text fields, use the label content control (Label content on the next page) or simply click on the exclamation mark, if there is one.

Note: Due to a limitation in Excel only the first 255 characters of text in a datasheet cell will be displayed in a label in PowerPoint. However, it is possible to work around the limitation by concatenating text in a formula, i.e., instead of `Very long text ...` you would type `="Very long "&"text ..."` into the datasheet cell.

Note: Alt+↵ can be used to add line breaks to text in the datasheet while F7 can be used to spell-check datasheet text.

Text label property controls

Font

The font control applies to all text labels. Click on a font to change the setting of the selected features. When you change the font for the element, all text that is later created within the same element adopts the new font.

Number format

The number format control applies to text fields that display chart data. To use the number format control, enter an example number with the desired format. The actual number you enter is not important, it is only the number format that matters. The dropdown box provides quick access to the most common formats. Also, up to four of your most recently used custom formats are available in the dropdown box. Absolute and relative values can have different formats.

You can use the following punctuation characters for the grouping of thousands: comma, point, single prime and space. For the decimal point, you can use point, comma or momayyez. However, you cannot use the same character for the grouping of thousands and the decimal point.

For example:

- Type `1.000,00` to display numbers with a comma for the decimal point, with two decimal places, and thousands separated by points.
- Type `1000` to display integer numbers with no grouping.
- You can add arbitrary prefixes and suffixes, with or without spacing: `$1.2M`

- If you want all numbers to be signed, select a positive number and enter a leading or trailing plus: `+1,234`
- Type `-USD 1,234` to place the algebraic sign in front of the currency, type `EUR -1.234` to place it in front of the value.
- With a negative number selected, remove the minus sign and enclose everything including prefix and suffix in brackets, e.g. `(1,2M)` to display bracketed negative values. If only a prefix or suffix is enclosed then the brackets are taken as literal characters, e.g. `1,234 (metric tons)`.
- Type `–1,234` with a leading en dash to replace all minuses with en dashes.

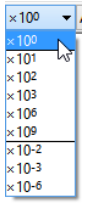
think-cell can also use a number format that has been set in Excel. To use this, first choose the desired number format in Excel using the **Format Cells**... dialog and then select **Excel Format** from the bottom of think-cell's number format control.

In the context of currency, some people use single prime as a symbol for million and double prime as a symbol for billion. If you want to use this convention with think-cell, start with entering millions into the datasheet or use the magnitude control to show the values in units of millions (see Magnitude on this page). Then, enter the appropriate format string into the number format control. If you do not use the single prime in the format string, the numbers followed by a double prime always represent billions – even if there are no more numbers following the double prime.

Consider the number `3842.23` (or the number `3842230000` combined with a magnitude setting of $\times 10^6$).

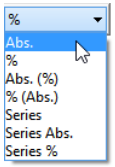
Number format control	Output
`1"234'000`	3″842′230
`1"234'0`	3″842′2
`1"00`	3″84
`1"`	4″

Magnitude



Values from data sources often have magnitudes that are not appropriate for data presentation. In think-cell, you can solve this problem by altering the magnitude of the labels without changing the data source.
Here is a simple example: Your Excel table is filled with seven-digit values (e.g. 3,600,000.00) but you would prefer to show values in units of millions. Simply select $\times 10^6$ from the floating toolbar and the labels will show the appropriately scaled values.

Label content



Most labels have a label content control. Use the control to choose text fields with which to fill the label. For example, the segment labels in the column chart can show absolute values and/or percentages. (For details about filling in the datasheet refer to Absolute and relative values on page 29.)

Some labels only have one entry in this dropdown box. You can use it to restore the label's text field if it was deleted.

Pasting text into multiple labels

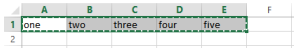
With think-cell, creating data driven charts is quick and easy, but you still have to type the text. If you already

have it available in some table or text file, think-cell can help you there, too.

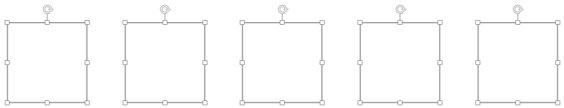
The text may be in a file in Microsoft Excel or Microsoft Word or in any other kind of text file. In Excel, labels are naturally separated into table cells. In plain text files, labels should be organized in columns (separated by line breaks) or in rows (separated by tab characters).

Pasting multi-selections is not only possible with chart labels but can also be used with any native PowerPoint shape.

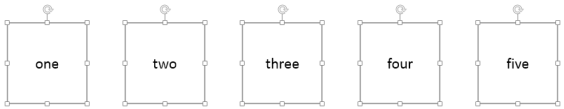
1. In your source file, select the text for all the labels or shapes and copy them to the clipboard (Ctrl+C or **Edit** → **Copy**).



2. Switch to PowerPoint. If the objects that are going to receive the text are not yet there, create them now. These objects can be native PowerPoint shapes as well as think-cell labels.



3. Multi-select the shapes or labels that you want to fill with text. For more tips on multi-selection, refer to Multi-selection on page 18.
4. Paste the text from the clipboard (Ctrl+V or **Edit** → **Paste**).

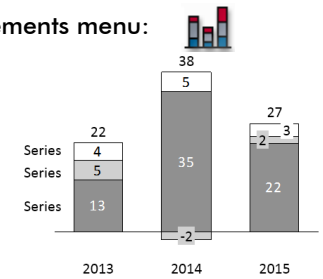


If the text from the source is properly separated by line breaks and/or tab characters, each of the selected shapes or labels in PowerPoint receives the corresponding text from the clipboard.

7. Column chart, line chart and area chart

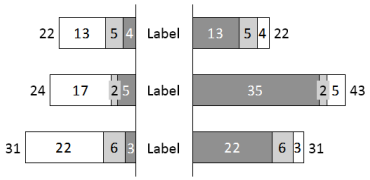
Column chart and stacked column chart

Icon in Elements menu:



In think-cell, we do not distinguish between simple column charts and stacked column charts. If you want to create a simple column chart, enter only one series (row) of data in the datasheet. For a quick tour of the column chart, refer to the example in the chapter Introduction to charting on page 24.

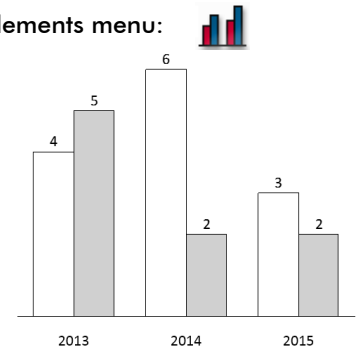
Bar charts in think-cell are simply rotated column charts, and can be used exactly as column charts. In addition, you can create *butterfly charts* by placing two bar charts "back-to-back". To do so, apply the functions rotation (see Rotating and flipping elements on page 17) and same scale (see Same scale on page 46). Then remove the category labels for one of the charts.



For the steps to create a stacked clustered chart, see Clustered chart on this page.

Clustered chart

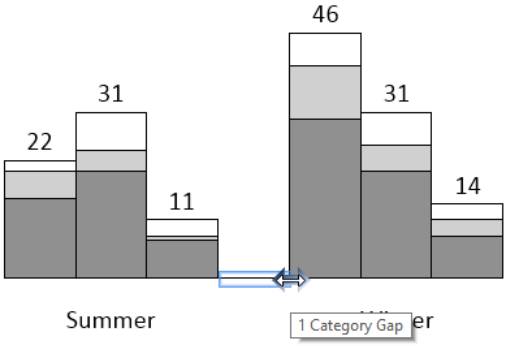
Icon in Elements menu:



The clustered chart is a variant of the stacked column chart, with the segments arranged side-by-side.

A clustered chart can be combined with a line chart by selecting a segment of a series and choosing **Set to Line Type** from the context menu.

If you want to arrange stacks of segments side by side, you can create a stacked clustered chart.



To create a stacked clustered chart, follow these steps:

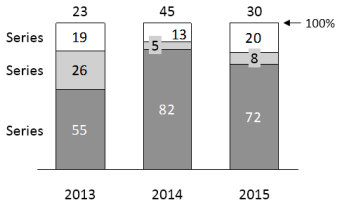
1. Insert a stacked chart.
2. Click onto the baseline between the columns, drag the gap arrow to the left and set the gap width to "0."
3. Click onto the baseline where you want to insert a full category gap and drag the gap arrow to the right until the tooltip shows "1 Category Gap"; this has to be repeated for all clusters.

If there is an even number of stacks in a cluster, the label cannot be centered to the whole cluster. Use a PowerPoint text box as a label in this case.

100% chart

Icon in Elements menu:

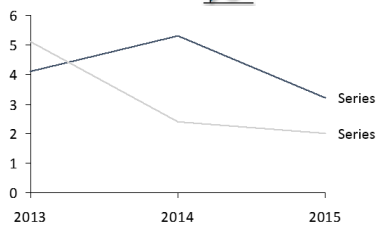
The 100% chart is a variation of a stacked column chart with all columns typically adding up to the same height (i.e., 100%). The labels of the 100% chart support the label content property, which lets you choose if you want to display absolute values, percentages, or both (Label content on page 36).



With think-cell, you can create 100% charts with columns that do not necessarily add up to 100%. If a column totals to more or less than 100%, it is rendered accordingly. For details about filling in the datasheet refer to Absolute and relative values on page 29.

Line chart

Icon in Elements menu:



The line chart uses lines to connect data points belonging to the same series. The appearance of the line chart is controlled by the line scheme, marker scheme, line style and marker shape controls in the floating toolbar. See Formatting and style on page 19 for details on these

controls. Labels for the data points are not shown by default but may be displayed using the line chart **Add Point Label** context menu button.

If the category values of a line chart are strictly increasing numbers or dates then the x-axis will automatically switch to a value axis (see Value axis on page 43). When dates are used the date format can be changed by multi-selecting all category labels (see Multi-selection on page 18) and typing a date format into the control (see Date format codes on page 76). If you want to show more labels than would fit next to each other horizontally you can use label rotation (see Label rotation on page 34).

The horizontal axis can only switch from category to value mode if the following conditions are met:

- All category cells in the datasheet contain numbers and Excel's cell format is also set to **General** or **Number** *or* all category cells in the datasheet contain dates and Excel's cell format is also set to **Date**.
- The numbers or dates in the category cells are strictly increasing from left to right.
- The y-axis is not set to **Crosses Between Categories** (see Positioning the value axis on page 43). If only this requirement is preventing a switch to the value axis mode, you can use **Make Value Axis** from the axis context menu to switch to **Crosses At Categories** and thereby switch to the value axis mode as well.

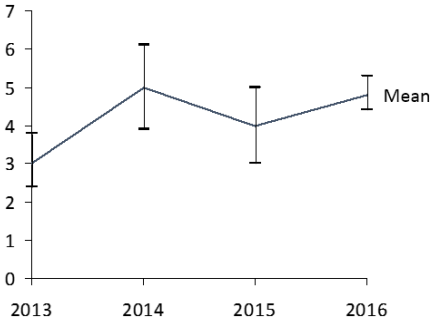
The line chart can also display a second vertical value axis. Please refer to Secondary Axis on page 47 for further information.

Smoothed lines

If you prefer a smoother appearance of the lines in a line chart, you can turn on this setting. First right-click on the desired line, then use the **Set to Smooth Line** button.

Error bars

Error bars can be used to indicate deviations. By means of the error bars the following chart can be created.



1. Create a line chart with three series. The first series reflects the upper deviation, the second series reflects the mean and the third series reflects the lower deviation.
2. Right-click the center line and choose **Add Error Bars** from the context menu.
3. Remove the series labels for the upper and lower series.

Select one of the error bars to change the marker shape and color for the upper and lower deviation and the line type of the bar for all error bars. You can also select an individual error bar marker to change the properties for this marker only.

A handle appears at each end when you select an error bar. You can drag these handles to select which lines the error bars should span. You can also visualize intervals instead of the deviation around a central value if you set the error bar to only span two adjacent lines.

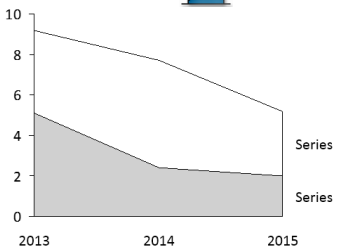
Interpolation

In line, area and area 100% charts, the **Interpolate** button can be used to display a chart with linear interpolation used for any missing data values in a series. In line charts, interpolation can be enabled and disabled for individual series in a chart. In area charts, it can only be applied to the whole chart, because the series stack on each other.

Area chart

Area chart

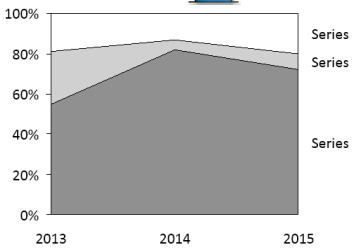
Icon in Elements menu:



An area chart can be thought of as a stacked line chart, with the data points representing the sum of the values in the categories rather than the individual values. The appearance of area charts is set using the color scheme control. Labels for the data points are not shown by default but may be displayed using the area chart **Add Point Label** context menu button. The area chart **Add Total** context menu button can be used to display total labels. Linear interpolation can be enabled using the **Interpolate** button (see Interpolation on this page).

Area 100% chart

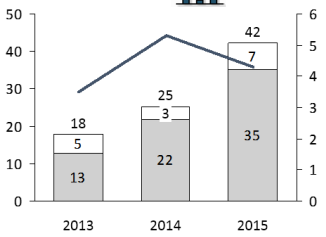
Icon in Elements menu:



The area 100% chart is a variant of the area chart with the sum of all the values in a category typically representing 100%. If the values in a category total more or less than 100%, then the chart will be rendered accordingly. See Absolute and relative values on page 29 for more details about specifying data values. The labels of the area 100% chart can display absolute values, percentages, or both (Label content on page 36). Linear interpolation can be enabled using the **Interpolate** button (see Interpolation on the current page).

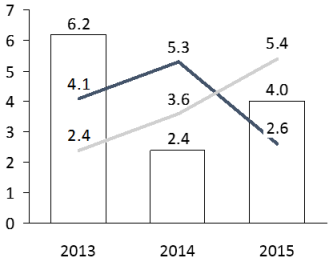
Combination chart

Icon in Elements menu:



A combination chart combines line and column segments in a single chart. Line chart on page 39 and Column chart and stacked column chart on page 38 describe in detail the usage of lines and column segments in charts.

To convert a line to a series of segments, simply highlight the line and select the **Set to Segment Type** button from the context menu. To convert segments to a line, simply highlight a segment of the series and select the **Set to Line Type** button from the context menu. The data sources of line charts, stacked charts and combination charts have the same format.



This function can be used in stacked and clustered column charts as well as in line charts.

8. Chart decorations

Scales and axes

Value axis

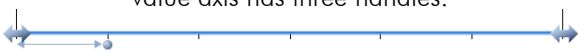
In menu: Chart

Menu item:

Use this feature to display a value y-axis.

Note: The x-axis of a Mekko chart is also a value axis. Similarly, scatter and bubble charts have two value axes that are always displayed. In addition, the x-axis of a line chart may be a value axis, rather than a category axis (see Line chart on page 39). The x-axes of all other charts are standard category axes.

Adjusting the scale of a value axis. When selected, a value axis has three handles:



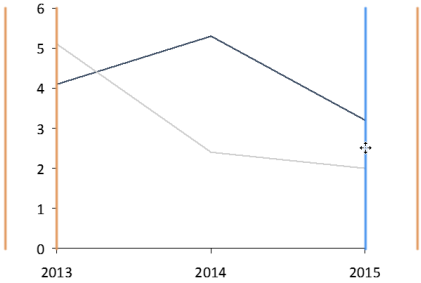
– Value axes are usually scaled by think-cell. You can, however, manually scale a value axis by dragging the handles at the end of the value axis. The values on the axis must always include the range between the lowest and largest value in the datasheet. If you do not want to show a specific value, either remove it from the datasheet or hide the respective datasheet row or column. Automatic value axis scaling can be restored by dragging the handles until the tooltip indicates **Automatic**. Holding down Alt while dragging ensures that the value axis scale will not revert to automatic mode.

– The tickmark spacing for value axes is usually calculated by think-cell. You can, however, manually adjust the tickmark spacing by dragging the middle handle. As you drag, the handle will jump to supported tickmark spacings, with a tooltip indicating the selected spacing. Releasing the handle will apply the indicated tickmark spacing to the axis. Automatic tickmark spacing can be restored by reducing the tickmark spacing until the tooltip indicates **Automatic**.

– The **Set Same Scale** button can be used to apply the same scale to multiple charts. See Same scale on page 46 for further details.

Positioning the value axis. A value y-axis can be moved by selecting and dragging the axis with the mouse. While dragging, available alternative locations for the axis will be highlighted. Dragging to the desired location and releasing will move the axis.

You will notice, when selecting and dragging the value y-axis of a line chart, that two locations on either side of the chart are highlighted. Dragging to either of the locations will position the y-axis on the appropriate side of the chart.



The location selected, however, also sets the *crossing* behavior for the chart. Two distinct styles of crossing behavior are supported for line charts:

– **Crosses At Categories** The y-axis crosses the x-axis at the center of a category. In this case the data points of the first category are placed directly on the y-axis.

– **Crosses Between Categories** The y-axis crosses the x-axis between two categories. Consequently, the data points are offset from the border of the chart.

Regardless of the crossing behavior of the axis, the x-position of data points always corresponds to the center of the category.

Selecting either of the innermost highlighted locations will set the behavior to **Crosses At Categories**, while selecting either of the outermost highlighted locations will set the behavior to **Crosses Between Categories**.

The and buttons in the value axis context menu can also be used to alter the crossing behavior.

Value axis context menu. Value axes have their own context menu. It shows the following buttons:

Add Tick Marks Add or remove tickmarks.

Add Tick Labels Add or remove tickmark labels.

Add Grid Lines Add or remove gridlines.

Add Title Add or remove an axis title. You can drag the title to choose its placement.

Set Logarithmic/Linear Scale Set the axis to a logarithmic or linear scale (see Logarithmic Scale on page 47).

Add Second Y axis Add a secondary axis (see Secondary Axis on page 47).

Fit Scale To Data Revert the scale and tickmark spacing to automatic sizing if they have been modified either by the user or by a same scale operation (see Same scale on page 46).

Add Break Add a break at the current mouse pointer position (see Value axis break on the current page).

Set Crosses At/Between Categories Alter the *crossing* behavior for a line chart.

Value axis break

In menu: Segment, axis, line, area

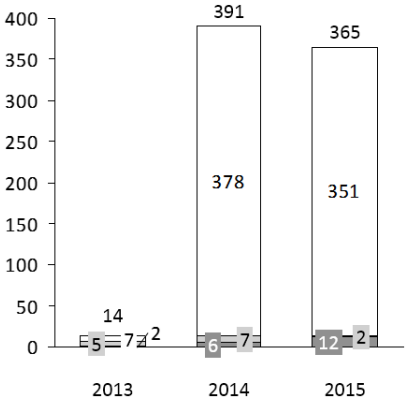
Menu item:

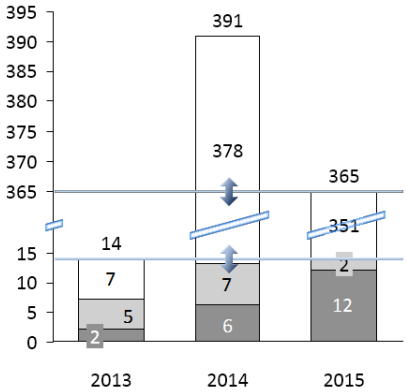
Use a value axis break to shrink a particularly large segment and enhance readability for the smaller segments. To add a value axis break, click the part of the segment or axis where you want the break to go and open the context menu. When adding a value axis break, the

exact position where you right-click a segment or axis makes a difference.

Any break you insert applies to the value axis (if shown) and to all segments sharing the same range of the axis. For this reason, you can not add a break to the axis at any position where there is a segment border in any of the chart's columns. A break can only be added if at the mouse pointer location there is some part of the value axis big enough to display at least the two lines that visualize the break.

This is illustrated by the following example. No break can be added to the very top part of the second column, because the top of the third column is too close. However, within the range of the third column's segment, there is enough space for the break. Since both columns share this range of the value axis, both segments are broken:





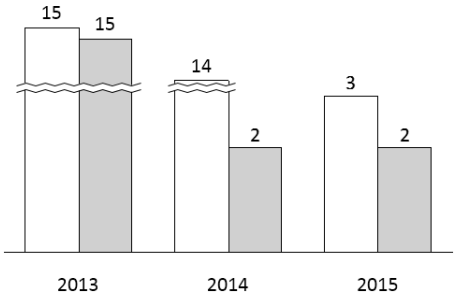
Note: If you apply the same scale operation (see Same scale on the following page) to charts that have value axis breaks, the breaks are automatically removed. As long as breaks are present, it is impossible to make the selected charts visually comparable.

Adjusting the break's extent. You can adjust the size of a broken segment by dragging the lines that appear when you select the break. These lines mark the range of the scale that is compressed to save space. Drag the lines to determine the size of the compressed part of the scale. If you drag a line far enough for the compressed range of the scale to take as much space as was originally required, the break disappears. The default is to compress the selected part of the scale as much as possible while leaving enough room for the break lines to be rendered.

Available break styles. There are two types of break shapes supported by think-cell. The straight break as illustrated above is commonly used for standard column charts. The wiggle break as illustrated below is convenient to save space in charts with wide or adjacent

columns. If enough space is available, you can toggle between the two shapes with **Set Wiggle/Straight Shape** in the break's context menu.

Note: In line and area charts only the wiggle style is supported.



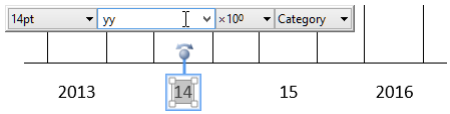
Date axis

If the datasheet contains strictly increasing year numbers, the number format of the axis labels can be changed to one of the date formats, e.g., `yy` for two-digit years, `yyyy` for four-digit years and additional formats containing days and months (see Number format on page 35 and Date format codes on page 76).

When the labels are formatted as dates, or when Excel's cell format is set to **Date** for all category cells, you are using a date axis. When adjusting the scale of a date axis, years, months and weeks can be used for tickmark spacing.

You can mix two- and four-digit year numbers on a date axis. For example, you might display the first and last category with four-digit years and all categories in between with two-digit years.

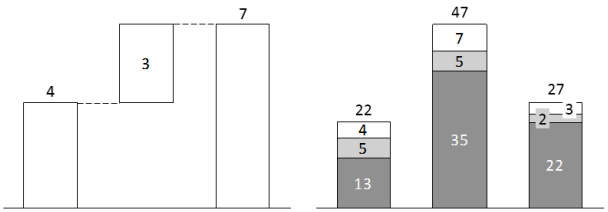
To choose the number of digits, you click the label you want to change and adjust the format. think-cell will automatically adjust other labels to ensure a consistent display. For example, if you only select the first label and use the two-digit date format `yy`, all labels switch to two digits as it us unusual to use two digits for the first label only. However, if you select one of the labels in the middle and use two digits, the first label will remain with four digits, but all other labels between the first and the last label will be switched to two digits:



Same scale

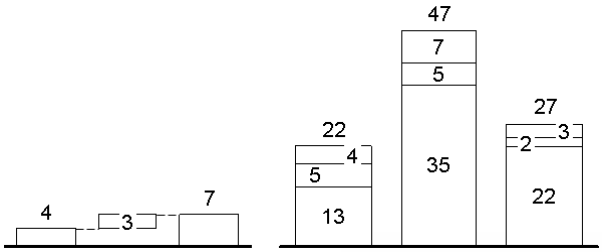
When there are multiple similar charts on the same slide, it is often desirable that all of them share the same scale. Only when two charts share the same scale, are the physical sizes of their bars or columns comparable.

The following example shows two charts which have the same size, but not the same scale. Note that the column that represents 7 units in the waterfall chart is the same height as the column that represents 47 units in the column chart.



To make columns from different charts visually comparable, select all those charts together. Then, open the

think-cell context menu of one of them and click the **Set Same Scale** button to resize smaller scales to match the largest one. In the above example the resulting charts look like this:



When the data represented by a chart changes, it is possible that this chart rescales. If you still want to keep the same scale for multiple charts, you may have to reapply the same scale operation. The same applies if you manually changed the scale of one of the charts.

To revert the same scale, select one or multiple charts and click the **Fit Scale to Data** button. If you are not sure which charts share the same scales, the easiest way is to revert the same scale for all charts, then to select the requested charts and to activate same scale.

Note: If you apply the same scale operation to charts that have value axis breaks, the breaks are automatically removed (see Value axis break on page 44). As long as breaks are present, it is impossible to make the selected charts visually comparable.

Logarithmic Scale

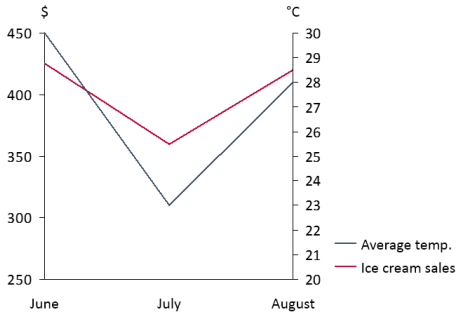
You can switch to a logarithmic scale by using the **Set Logarithmic Scale** button from the value axis context menu. To revert to a linear scale choose **Set Linear Scale**.

Note: Due to a limitation in Microsoft Graph an axis with a logarithmic scale can only have tickmarks at powers of 10, e.g. at 0.1, 1, 10. The axis must also begin and end at a power of 10.

Logarithmic scaling is not supported when it is mathematically not appropriate. Negative values are placed on the baseline and an exclamation mark ! is shown next to the label explaining that the value cannot be represented on a logarithmic scale. Also, an axis always uses a linear scale if multiple series that are added up to a total are associated with the axis.

Secondary Axis

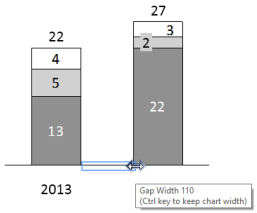
Charts containing lines may have an additional, secondary y-axis. You can add a secondary y-axis, and associate a line with this axis, by highlighting a line and selecting the **Set to Right/Left Axis** button from the line context menu. If a chart has two y-axes, then you can use the same **Set to Right/Left Axis** button to alter the y-axis association of individual lines in the chart. A secondary axis is a fully-fledged value axis (Value axis on page 43) and may be scaled independently.



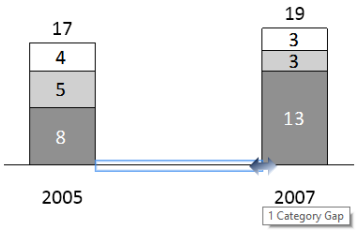
Gap width and category gap

The basic spacing between columns in a chart is specified by the gap width. Extra spacing between individual pairs of columns may be added by inserting a category gap.

The gap width for all columns can be altered by clicking on the baseline and dragging the handle a small distance. The handle snaps to the default gap width. In order to achieve a consistent appearance for charts throughout your presentation, the default gap width should be used when possible.



Category gaps can be introduced by dragging the same handle further to the right until the category gap tooltip appears. The handle snaps to multiples of the column width.



Altering the gap width or introducing category gaps by simply dragging preserves the width of the columns, resulting in an increase or decrease of the overall chart width.

You can ensure that the overall chart width is preserved by holding down the Ctrl key while dragging: the column widths will be increased or decreased to accommodate the altered gaps.

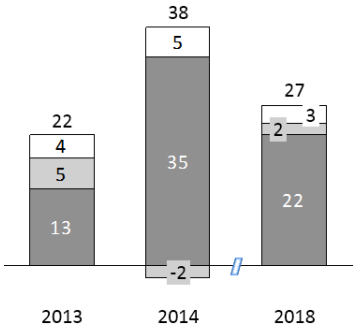
Note: In some cases, a break in the baseline (see Category axis break on the current page) may be a space-saving alternative to a category gap.

Category axis break

In menu: Category axis column gap

Menu item:

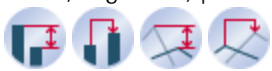
A category axis break indicates a break in the continuity of the category axis scale. To insert the break, right-click on the category axis between two columns and select the respective menu item.



Arrows and values

Difference arrows

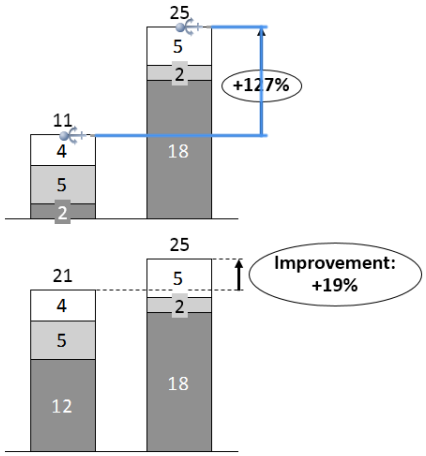
In menu: Chart, segment[1], point[2]

Menu items: 

Difference arrows can be used in charts to visualize the difference between pairs of columns, segments or points. The difference is automatically calculated and updated whenever the underlying data changes. The text label for the difference (chapter Text labels on page 32) supports font, number format and label content properties (Font on page 35, Number format on page 35, Label content on page 36).

Two distinct styles of difference arrows are supported by think-cell: segment (or point) difference arrows and category difference arrows. Segment difference arrows are designed to show differences between pairs of segments or points in a chart; category difference arrows are designed to show differences between column totals.

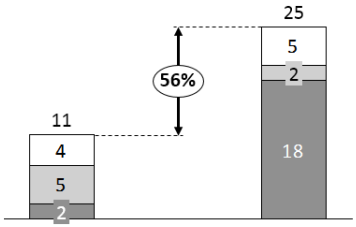
Segment difference arrow. Segment difference arrows can be added by selecting the or button in the context menu. You can use the handles that appear when the difference arrow is selected to set the two values that are to be compared. The ends of the difference arrow can be attached to column segments, data points or to a value line, if there is one (Value line on page 51).



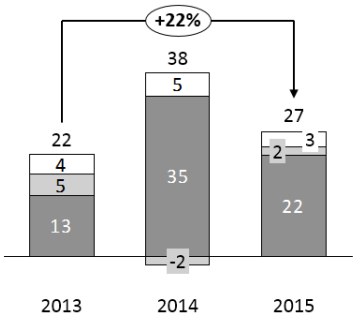
By default, a newly inserted difference arrow stretches from the selected segment or category to the top segment of the next category. You can also determine the desired start and end segment/category for the difference arrow immediately by selecting the start segment and the end segment at the same time. Then right-click on one of them and select **Add Segment Difference Arrow**. To select multiple segments at a time, hold down Ctrl key while selecting (see Multi-selection on page 18). In case of a line or area chart, select the corresponding data points instead of segments.

If the arrow is so small that the bubble would cover it up, the bubble is automatically placed next to the arrow. To manually optimize the layout, you can drag the arrow itself as well as its label to other locations (Automatic label placement on page 33). If you want to place the arrow between two columns, you might want to create an additional gap between the columns (Gap width and category gap on the previous page).

[1] column and waterfall charts
[2] line and area charts



Category difference arrow. Category difference arrows can be added by selecting the or button in the context menu and connecting the ends of the difference arrow to the categories or columns that are to be compared.



Arrow modes. You can cycle through three arrow modes. The button in the context menu changes accordingly and the number in the label is recalculated:

- Show an arrow pointing in one direction and calculate the relative difference.
- Show a double-ended arrow and calculate the absolute difference.
- Show an arrow pointing in the other direction and calculate the relative difference.

CAGR arrow

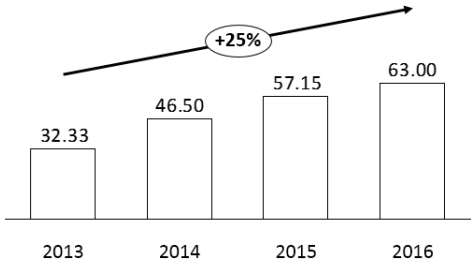
In menus: Chart, segment

Menu item:

This feature visualizes the *compound annual growth rate*. The range of dates on which the calculation is based is taken from the datasheet cells that are associated with category labels. The CAGR is automatically calculated and updated whenever the underlying data changes. For the calculation to work correctly, it is important that the respective datasheet cells contain the correct dates.

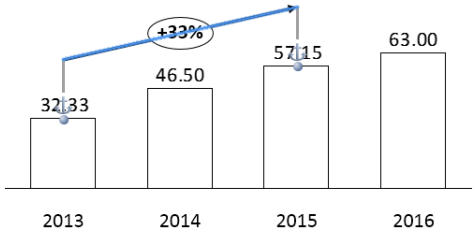
The CAGR from category A to B is calculated as $\sqrt[n]{\frac{\sum B}{\sum A}}$ with n being the number of years in the date range. The 30/360 day count convention is followed to determine n when it is not a whole number.

The automatic display of the CAGR is based on a text label (chapter Text labels on page 32) and supports font and number format properties (Font on page 35, Number format on page 35). The arrow itself supports the color property (Color and fill on page 19).



By default, only one CAGR is inserted that stretches from the selected category to the last category in the chart. You can use the handles that show up when the CAGR arrow is selected to specify its start and end categories.

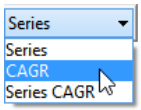
You can also determine the desired start and end categories for the CAGR immediately: Select a segment in the start category and a segment in the end category. Then right-click on one of them and click **Add Compound Growth Arrow**. If you select segments in more than two categories, you will get a CAGR for each pair of successive selected categories. To select multiple segments at a time, hold down Ctrl key while selecting (see Multi-selection on page 18). In case of a line or area chart, select the corresponding data points instead of segments.



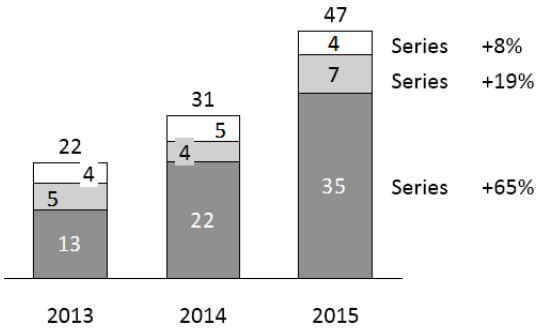
Series CAGR

The CAGR arrow is always calculated based on the column totals. However, you might also like to visualize the compound annual growth rate of one of the series.

This can be shown in series labels. Simply select the label and choose the CAGR option from the right-most menu on the floating toolbar.



Now the CAGR is calculated series-wise.



To select all series labels in one action, click the first label, then Shift-click the last one (see Multi-selection on page 18).

Value line

In menu: Chart

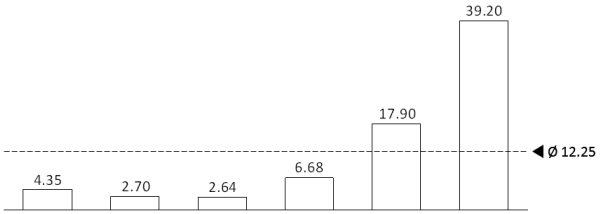
Menu item:

This feature displays a line parallel to the x-axis to visualize a certain value. You can create multiple value lines per chart, and you can choose to have the line's label placed to the left or to the right of the chart.

Where appropriate, the value line is initialized with and snaps to the arithmetic mean (stacked chart, clustered chart) or the weighted mean (Mekko chart) of the column totals. If the line is snapped to such a value, this value is calculated and automatically updated when data changes.

You can drag the line as desired. If you need to increase the precision of the dragging operation, use PowerPoint controls to zoom in on the slide. You can also use the cursor keys ← → ↑ ↓ to nudge the line to a specific value. When using the cursor keys, the line moves in increments corresponding to the label's number format.

As always, you can add custom text to the label or replace the predefined label with your own content. You can learn more about labels and text fields in the chapter Text labels on page 32. You can also change the label's font (see Font on page 35) and number format (see Number format on page 35).

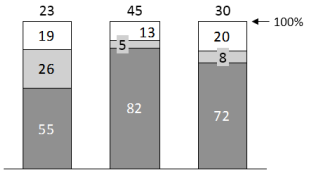


100% indicator

In menu: Chart

Menu item:

This feature shows a "100%" mark. It is on by default. You can choose to have the label placed to the left or to the right of the chart.

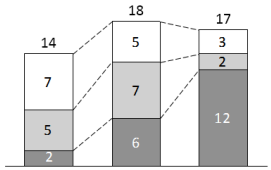


Series connectors

In menus: Chart, segment

Menu item:

You can add series connector lines to an entire chart or to a single segment. If you click the connector item of a segment's menu, a connector line is created at the top right corner of that segment. If you want a connector as part of a waterfall calculation, you must use the specific waterfall connector (see Waterfall chart on page 54). Alternatively, universal connectors (see Universal connectors on this page) can be used when the desired connections cannot be achieved using standard connectors.



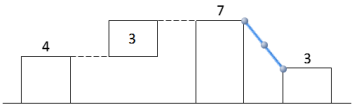
Universal connectors

Icon in Elements menu:

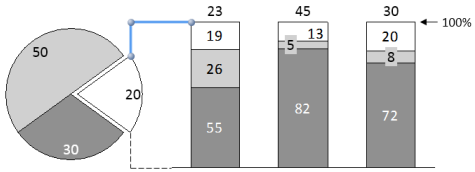
Universal connectors are different from the other decorations described in this chapter, because they do not belong to a specific element or feature. Therefore, they are not available in the think-cell context menu.

Instead, you can insert universal connectors from the think-cell toolbar. Double-click the toolbar button to insert multiple connectors. To leave insertion mode, click the button again or press the Esc key.

Each chart element can offer connectable points. The universal connector can connect any two connectable points that may or may not belong to the same element. Use the universal connector if you need an unusual connector that is not supported by the chart itself.



You can also use the universal connector to connect two different charts. The handles at the ends of the connector snap to connectable points while you move them. The handle in the middle of the connector can be dragged to change the straight connector to one with a right angle.



Note: The universal connector visually connects two objects, but it has no effect on the calculation of the waterfall chart. If you want a connector as part of a waterfall calculation, you must use the specific waterfall connector (see Waterfall chart on the next page). Standard connectors (see Series connectors on the preceding page) are also available for a number of chart types and should be used in preference to universal connectors when possible.

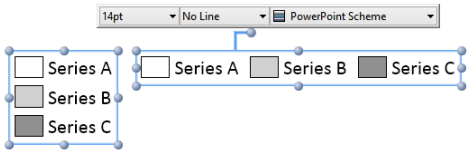
Legend

In menu: Chart

Menu item:

A legend can be used to clearly identify the various data series or groups in a chart.

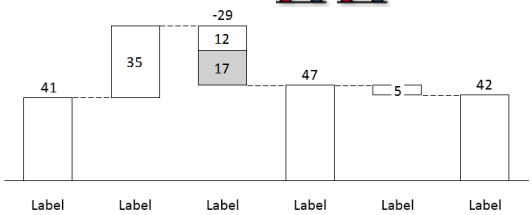
A floating toolbar containing a line style and a font control (Text label property controls on page 35) appears when the legend is selected, letting you specify a line style for the legend box and the size of the legend text. In addition, chart-specific property controls for the series and groups are available.



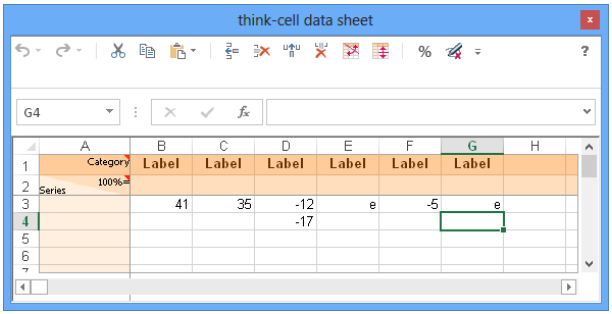
If you change the size of the legend's frame the legend text will be automatically reformatted to fit the new frame size. To create a horizontal legend, for example, pull the left or right border of the frame outwards.

9. Waterfall chart

Icon in Elements menu:

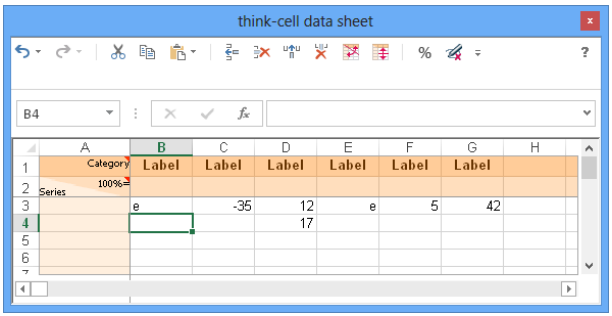


A waterfall chart (sometimes called **bridge chart**) visualizes an additive calculation with subtotals. To create a waterfall chart, simply type the calculation into the datasheet:



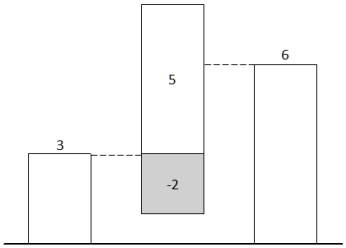
Positive values result in segments going upwards, negative values create segments going downwards. Subtotals – i.e. segments that go all the way down to the baseline of the chart – are easily created with an `e` (for "equals"). In fact, you can use `e` in any segment that you want to be stretched to fit the rest of the chart. All `e` segments are calculated by think-cell and automatically kept up-to-date when data changes.

You can even begin the calculation with an `e` in the first column. In this case, think-cell starts from the right-most column and calculates backward to find the value for the `e` column. Thus, the following data sheet results in the same chart as shown above:



You may enter two or more values into a single column. If you have a column made up from more than one segment, you can enter an **e** for at most one of them.

When both positive and negative values are used in a single column, the mathematical sum of all values will be used to continue the calculation, i.e., for two segments of values 5 and -2, the gap between the connectors on the sides of the column will be 3. At the same time, all individual segments are always displayed with the correct extent. To visualize the mathematical sum of the signed segments, the connector will use an anchor that may not correspond to the top or bottom of any individual segment:



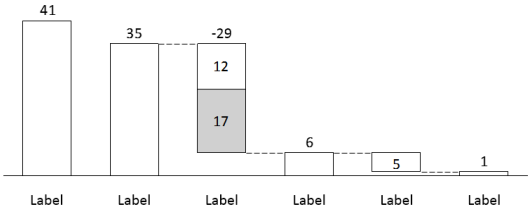
Due to the complexity of the waterfall chart concept, only simple charts can be created by using the datasheet alone. If you notice that the chart does not build up the way you want it to, first finish typing in the data. It is easy to reconfigure the chart later with the mouse.

In a basic waterfall chart, every two columns are connected by precisely one horizontal connector. When selected, these connectors show two handles.

– Drag the connectors' handles to change the way columns are connected in the waterfall.

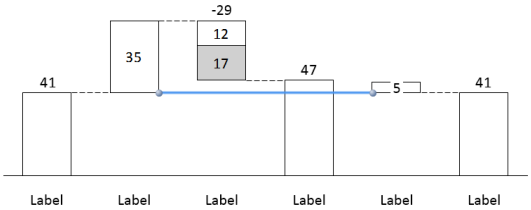
– Remove a connector with Delete in order to start a new summation. Add a connector by clicking **Add Waterfall Connector** in the context menu.

Based on the initial example, in the following chart the connector between the 1st and 2nd columns has been removed:



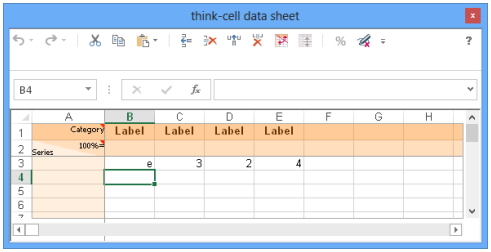
Whenever you drag a connector, the entire chart rearranges to accommodate the change and all "equals" columns are updated.

Also based on the previous example, in the following chart an equals column has been added and both ends of the highlighted connector have been moved:

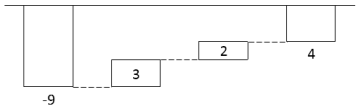


If connectors are conflicting with each other, skew connectors will result. Remove some of the skew connectors to resolve the problem.

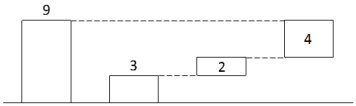
For example, to create a build-up waterfall with the total on the left, enter the following data into the sheet:



The resulting chart looks as follows:



Now drag the right handle of the highlighted connector to connect the "equals" column with the top of the last segment. This is the resulting chart:



If you want to create a build-down waterfall chart, use the toolbar icon. The default datasheet is then filled with values appropriate for a build-down waterfall. Apart from this, there is no difference between a build-up and a build-down waterfall chart in think-cell.

Waterfall charts can be decorated like column charts. You can decorate axes, add arrows, change gaps, etc. (see Scales and axes on page 43 and Arrows and values on page 49)

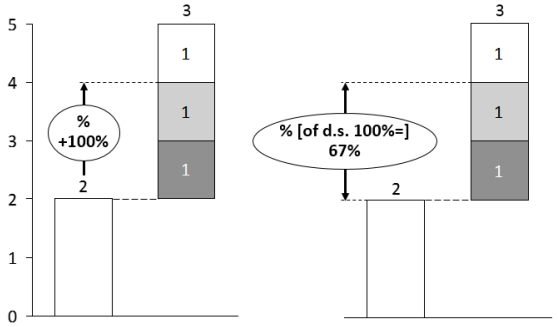
By default, the segment labels in waterfall charts show the extent of the segment which is always a positive value. Negative values in the datasheet are represented visually by downward-going segments. However, you can select a positive number and enter a leading or trailing plus in the number format (see Number format on page 35) to show a sign for both positive and negative numbers or, you can select a negative number and enter a leading or trailing minus to only show a sign for negative numbers.

Note: If all segments are connected properly and the chart is still not grounded on the baseline the way you want it to, select the segment that should be grounded and force it to the baseline with the or buttons.

"Percent of datasheet 100%=" as label content

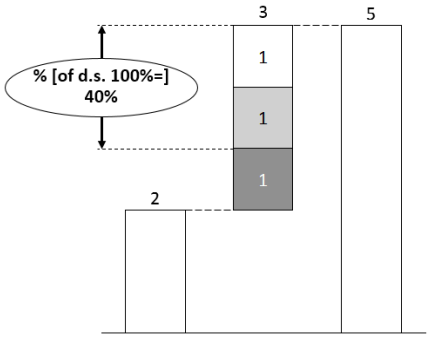
Labels for segment difference arrows (see Segment difference arrow on page 49) in waterfall charts additionally support the display of values as percentages of the 100%= value in the datasheet (**% of datasheet 100%=**).

Selecting **%** as the label content for a segment difference arrow label in a waterfall chart displays the difference between the start and end of the arrow, taking the starting point of the arrow to be 100%. In contrast, selecting the **% of datasheet 100%=** label content displays the same difference but takes the 100%= value of the column pointed from by the start of the arrow to be 100%.



The above charts illustrate the two settings for the label content. In the left diagram, the difference of 2 is compared to the starting value of 2, resulting in the display of +100%. When the 100%= value in the datasheet is left empty it is taken to be the sum of the column. Therefore, in the right diagram, the difference of 2 is compared to the column sum of 3, resulting in the display of +67%.

Another application is illustrated by the following chart. For the central column the waterfall total of 5 was set as the 100%= value in the datasheet. Using the **% of datasheet 100%=** setting it is possible to show that the upper two segments correspond to 40% of this total.



10. Mekko chart

A Mekko chart (sometimes also called *marimekko chart*) is a two-dimensional stacked chart. In addition to the varying *segment heights* of a regular stacked chart, a Mekko chart also has varying *column widths*.

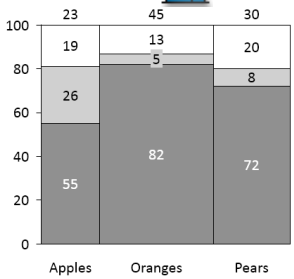
Column widths are scaled such that the total width matches the desired chart width. To preserve the visual relationship between widths of different columns, there are no gaps between columns in a Mekko chart.

In fact, the baseline of a Mekko chart is a fully fledged value axis. You can select it with the mouse, and you can use its context menu to add tickmarks, tickmark labels and an axis title (see Value axis on page 43). If you have enabled tickmarks for the baseline, you can use the floating toolbar of the axis to switch between absolute and percentage values.

A Mekko chart can also be decorated with some of the features described in Scales and axes on page 43 and Arrows and values on page 49. The labels of the Mekko chart support the label content property, which lets you choose whether you want to display absolute values, percentages, or both (Label content on page 36).

Mekko chart with %-axis

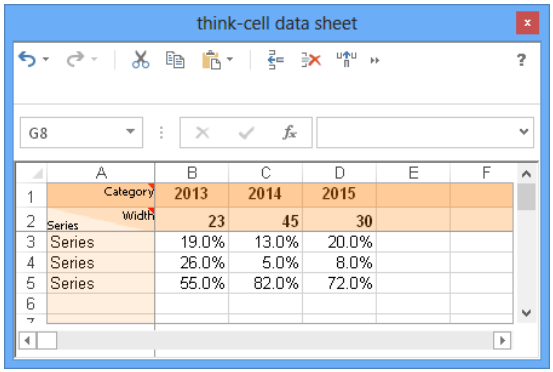
Icon in Elements menu:



A Mekko chart with %-axis (sometimes also called *marimekko chart* or *100% cost curve*) is a two-dimensional 100% chart. As in the 100% chart, the value axis is based on percentages and column heights are shown relative to 100%. In the regular 100% chart, since the columns are scaled to relative heights, there is no visual representation of absolute column totals.

The Mekko chart with %-axis extends the 100% chart and uses variable column widths to represent column totals. Thus, the *segment area* is proportional to the absolute value of the segments. As in the 100% chart, by

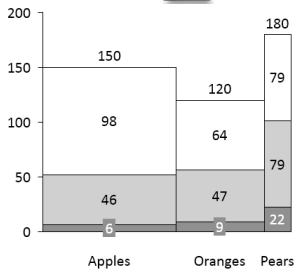
default the datasheet takes percentages and the 100%-equivalent values are entered explicitly in the row labeled **Width**. As an example, the above Mekko chart is rendered from the following datasheet:



Alternatively, you can also enter absolute values into the datasheet. In this case, for all columns that add up to 100%, you can leave the **Width** row empty. For details about entering relative or absolute values refer to Absolute and relative values on page 29.

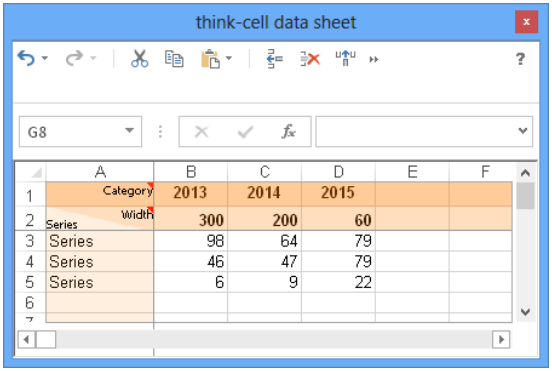
Mekko chart with units

Icon in Elements menu:



A Mekko chart with units (sometimes also called *submarine chart* or *olympic chart*) is a two-dimensional stacked chart. As in the regular stacked chart, the value axis and the datasheet of this chart are based on absolute values.

Width and height are controlled completely independently. Column widths are entered in the **Width** row on top and individual segment heights are entered as in a regular stacked chart.

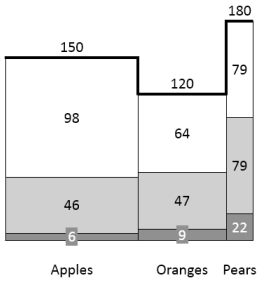


Ridge

In menu: Chart

Menu item:

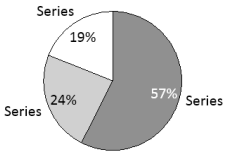
You can highlight the outline of the Mekko chart: Click the **Ridge** button to add or remove a bold ridge.


150
120
180
98
64
79
79
46
47
6
9
22
Apples
Oranges
Pears

11. Pie chart

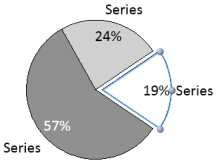
Icon in Elements menu:

A pie chart is actually a special case of a 100% chart with only one category (column) of data.

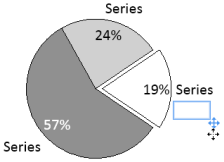


Each slice of a pie chart shows three handles, when selected. Each of the handles can be dragged with the mouse to rotate the pie. When rotating, the handles snap at positions 0°, 90°, 180° and 270°, making it easy to create an aesthetically pleasing layout.

The pie chart remembers which handle you were dragging when rotating the chart and preserves the correct orientation even when the data is changed. In addition, you can drag the handles away from the pie in order to emphasize the respective pie slice.



The labels of the pie chart support the label content property, which lets you choose if you want to display absolute values, percentages, or both (Label content on page 36). Additionally you can move each outside label to place it anywhere on the outer edge of the respective slice.

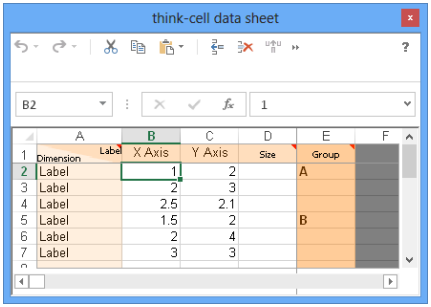


Universal connectors can be used to connect pie charts with other chart types (see Universal connectors on page 52).

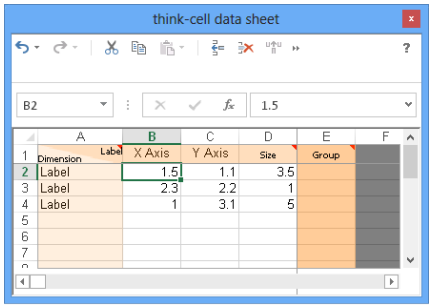
12. Scatter chart and bubble chart

Scatter charts and bubble charts are similar in many aspects, both using an xy-plot to visualize datasheet contents. The charts differ, however, in the style of markers used for the individual data points.

The datasheet for a scatter chart is organized as follows, with each row representing a single data point:



The datasheet for a bubble chart contains values in the **Size** column, but is otherwise organized identically:



The **Group** column in the datasheet can be used to organize individual data points into groups. In the above scatter chart datasheet, the first three data points belong to group A while the remaining data points belong to group B. Multiple data points belonging to the same group can be easily selected by clicking on a data point and then moving the mouse pointer while holding down the Shift ⇧ key (see Multi-selection on page 18).

The axes of scatter charts and bubble charts can also be adjusted. Please refer to Scales and axes on page 43 for details. You may also use dates for the X or Y values. When all cells in the datasheet for one axis contain dates and Excel's cell format is set to **Date**, then the tickmark

labels of this axis show dates and you can format them accordingly (see Date format control on page 75).

Labels

In both chart types, up to two labels can be associated with each data point. Labels can be added using the **Add Label** button and removed using the **Remove Labels** button. The label content control lets you select the format of the text field for each label, allowing the display of the label text as well as the x, y and size values (see Label content on page 36). By default, labels are disabled in charts containing more than 50 data points. If required, they can be enabled using the context menu.

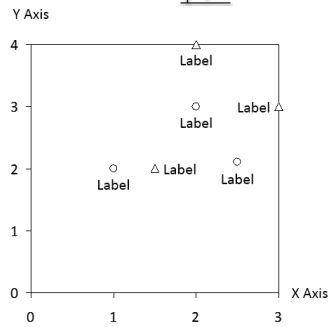
The automatic labeler places labels as close to their data points as possible, using connecting lines if necessary (see Automatic label placement on page 33). The labeler starts as soon as the datasheet is closed, restarting when data values, labels or sizes are changed.

While the labeler is busy calculating the label placements, a rotating progress icon appears in the upper left corner of the chart and the concerned chart is highlighted with a light gray frame. You can save the file or continue to work on other charts or slides while the labeler is running.

In rare circumstances the labeler may not find an optimal placement for all labels. When this happens, manually placing labels will help. Try to manually place one of the poorly placed labels and let the labeler automatically place the remaining labels. An acceptable placement for all labels can normally be achieved by manually placing only a few problematic labels.

Scatter chart

Icon in Elements menu:



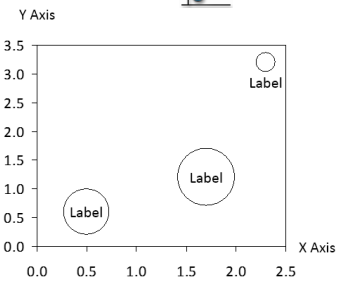
The scatter chart uses the marker scheme control to consistently mark data points belonging to the same group (see Marker scheme on page 22). The marker shape control can be used to set the marker shape for individual data points (see Marker shape on page 21).

If you choose **No Markers** in the marker scheme control, the markers for the data points are switched off. In this case the labels are centered on the position of the data points. However, the automatic label placement may offset the labels from this position to prevent overlap.

It is not possible to both switch off the marker and hide the label for a data point.

Bubble chart

Icon in Elements menu:



The bubble chart is a variant of the scatter chart, with data points marked by circles. The circle sizes are determined by the values in the **Size** column. By default, the **Size** value is proportional to the area of the circle. The **Make Diameter Represent Size** button in the context menu can be used to set the **Size** value to be proportional to the diameter of each circle.

To enable a legend of the bubble size, click **Add Bubble Size Legend** in the chart's context menu. To change the bubble size used in the legend, select the bubble and drag the handle that appears on the right boundary.

When you select one of the bubbles inside the chart, a similar handle appears on the right boundary. Change the bubble size by dragging it. All other bubbles are scaled accordingly, as the ratio between bubbles is always determined by the numbers in the datasheet's **Size** column.

When two bubbles overlap, the smaller bubble will be shown in front of the larger one. To change the order, choose **Bring to Front** from a bubble's context menu.

Trendline and partition

In menu: Chart, data point

Menu item:

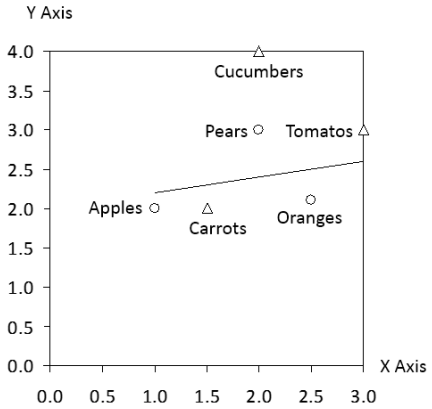
Trendline

In scatter or bubble charts you can let think-cell calculate a trend line for a group of values. A trendline is a graphical representation of trends in the group. They are used for the study of problems of prediction, also called regression analysis.

The trendline is calculated using linear regression so that the sum over all points of the quadratic difference between the Y coordinate and the trendline value at the X coordinate is minimized. In a bubble chart, the bubble size is not used when calculating the trendline position.

There are two ways to add a trendline to the chart:

- Right-click a marker or a bubble of the desired group and select **Add Trendline** from the context menu.
- Select a partition line (see Partition on the following page). In the toolbar you can choose a group of values and the line is changed to a trendline for this group.



You can change the background color on one side of the line and move the line in the same way as for a partition line (see Partition on the current page). However, once you have moved the line, it will no longer be calculated from the values in the datasheet.

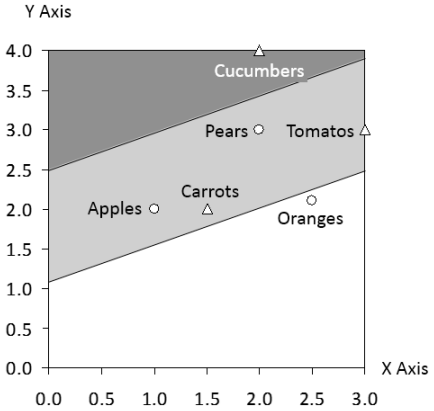
Partition

You can add a partition line to scatter or bubble charts to point up a partition of a set. To add a partition line, select **Add Trendline/Partition** from the chart's context menu.

You can move the line by clicking on it and dragging it to the desired position. It is also possible to select the partition line and then drag the handles at the beginning or end of the partition line. While dragging, the end points will snap to nice values. The spacing of the snap points depends on your current zoom level. If you hold down the Shift ⇧ key while dragging, the angle of the partition line is constrained to the current angle or to that of a vertical, horizontal or diagonal line.

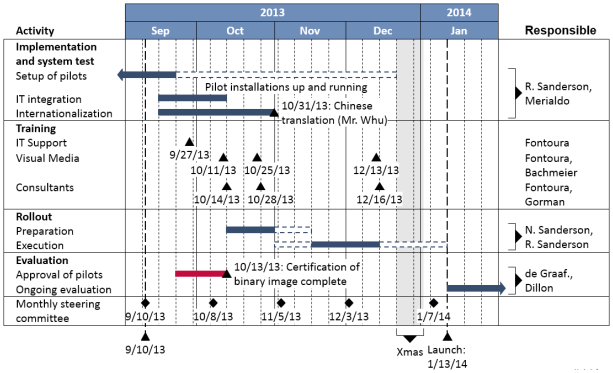
To make a copy of a partition line, hold down the Ctrl key while dragging. This is an easy way to create parallel lines, e.g. to mark a range of values.

You can change the background color of a set by clicking on the partition line and selecting a background color from the toolbar. To set the background color of the area on the other side of the line, right-click the partition line and select **Flip Filled Side**. You can also simply double-click the partition line.



If you want to calculate the position and angle of the line based on the values in the chart, see Trendline on the preceding page.

13. Project timeline (Gantt chart)



Icon in Elements menu:

A project timeline (sometimes called *Gantt chart*) visualizes project activities. The scale of a project timeline is a calendar. The duration of activities is represented by bars or process arrows, whereas singular events are represented by milestones.

Calendar scale

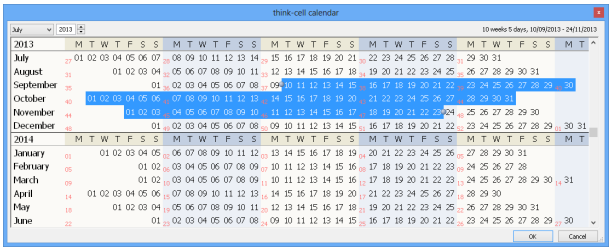
Naturally, in a project timeline the scale is based on dates. With think-cell, you can quickly change the visible date range. The appearance of the scale is initially automatic, but can be manually modified if needed.

Modifying the date range

When inserting a new project timeline, the calendar is initially scaled to show some time before and some time after the current date. There are two ways to change the date range that is shown.

You can open a calendar and select the dates you want:

- Double-click on a scale, e.g., the bar showing months, to open the **calendar dialog**.
- Alternatively click the **Open Calendar** button in the chart menu.

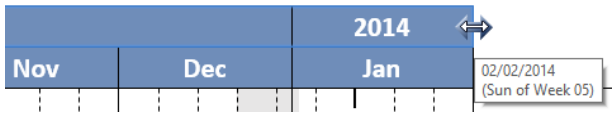


– Today's date is marked red.
– Select the desired start date with a single click, and select the desired end date with another click while holding down Shift ⇧. You may also just hold down the mouse button and drag the mouse along to determine a range. In the upper right corner you will find additional information about the selected period.
– Alternatively, you can use the cursor keys ← → ↑ ↓ and Page up Page down to select a different date range. To expand the range, hold down Shift ⇧ while moving.
– To edit a date range you can grab its beginning or end and drag it to the desired date.
– To scroll the calendar one line at a time, use your mouse's scroll wheel, click the scroll bar arrows, or drag the scroll bar handle. To scroll the calendar one page at a time, click onto the scroll bar above or below the handle.
– To jump to an arbitrary date, select the desired month and year using the controls in the window's toolbar. You can simply type in the desired year, if you do not want to use the control's up/down buttons. The calendar immediately scrolls to the desired position.
– You can vertically resize the window to see more months at a time, and you can horizontally resize the window to adjust the font size. The width of the window does not have an impact on the calendar layout: One line always represents precisely one month.
– When you are done, simply return to the PowerPoint slide by clicking the calendar window's **OK** button or by clicking on the slide. The selected date range will then be applied to the chart. If you want to discard your selection and keep the current setting, click **Cancel** or press Esc.

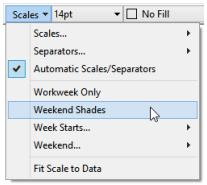
Alternatively, if you only need to adjust the beginning or the end of the range, you can simply change these values with the mouse:

1. Select a scale, e.g., the bar showing months.
2. Click and drag the handle that appears on the selected scale. The current date is displayed as a tooltip while you drag.
3. When you drop the handle, the chart is rearranged to accommodate the new date range.

While dragging the handles, they snap to integral units of the selected scale. You can quickly expand the chart to cover a large date range by dragging the handles of a scale with large units (e.g., years or months).



Scale display



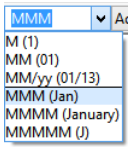
When changing the date range or the size of a chart, some scales as well as vertical separator lines may appear or disappear. Based on the range you select, together with the chart size and font size, think-cell suggests appropriate scales and separators to show. To make good use of this function, you should first select the desired date range before manually adding or removing scales or separators.

Altogether, there are five scales available in the project timeline chart: Years, quarters, months, weeks and days. In addition to showing or hiding scales, think-cell supports several options to change the look of the calendar. All of these settings are available in the menu **Scales**, located in the floating toolbar of the Gantt chart or one of the currently visible scales.

The **Scales** menu offers the following options:

- Using **Scales**..., show or hide each of the five available scales (years, quarters, months, weeks, days). Depending on the chart's current size and date range, some scales may not be available because there is not enough room to show their units. Once you decide to show a scale it will *not* hide again automatically, even when the chart's size or date range is changed.
- Using **Separators**..., show or hide vertical separator lines for each of the available scales (years, quarters, months, weeks, days).
- Enable or disable **Automatic Scales/Separators**.... When enabled, think-cell shows appropriate scales and separators depending on the date range, chart size and font size. Once you explicitly show or hide a scale or a scale's vertical separator lines, this option is disabled. When you enable it again, think-cell reverts to the scales and separator lines shown automatically.
- Enable or disable **Workweek Only**. When enabled, weekends are not shown in the chart.
- Enable or disable **Weekend Shades**. This option is only available if Workweek Only is disabled.
- **Week Starts**... lets you set the day that the think-cell calendar will use as the start of week.
- **Weekend**...: Here you can choose the days that match the weekend in your country.
- **Fit Scale to Data**: The chart's date range is adjusted such that all bars, milestones and brackets become visible.

Each scale supports various ways to display date information, e.g., the months scale may show month names like "September" or numbers like "09." You probably want to choose the appropriate format depending on the available space.

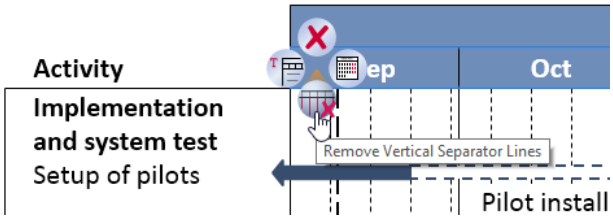


To do so, select the scale with the mouse and use the floating toolbar that appears to select the desired format. Since the dropdown menu is actually a date format control (see Date format control on page 75), you can also type in arbitrary date format strings.

Note: As with other labels, you can add arbitrary text to the scale labels, such as footnote markers or short comments.

Scale labels and separator lines

Each scale supports an optional label and optional separator lines. To use these features, open the context menu for the desired scale with a right-click.



Note: Primary and secondary separator lines are automatically assigned different styles.

The scales' context menu offers the following buttons:

Delete (Shortcut Delete) Delete the selected scale. You can show the scale again using the Scales menu from the toolbar. When you deleted a scale it will *not* show again automatically, even when the chart size or date range is changed.

Open Calendar (Shortcut double-click) Open the calendar dialog (refer to Modifying the date range on page 66).

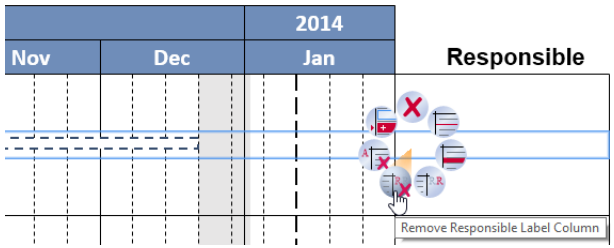
Add Vertical Separator Lines Explicitly add or remove vertical separator lines for the selected scale. You can also remove separator lines by selecting them and pressing the Delete key. The software automatically adds and removes these lines unless you are making an explicit choice.

Add Scale Label Add descriptive text to the selected scale. The label contains language-dependent predefined text which can be replaced as needed.

Rows (Activities)

A project timeline is made up of rows, each representing a certain activity that is named in the label to the left. The rows, in turn, contain timeline items such as bars, milestones and brackets.

You can explicitly select an entire row to change its look, add or remove labels, drag it to another location or use Shift ⇑+Alt and the cursor keys ↑ and ↓ to move it.



Note: There is a special row below the chart reserved for the most important milestones. You cannot add bars to this row, you cannot move it by drag-and-drop, and you cannot delete it. Otherwise, it is just an additional activity row which is always there.

Adding and removing rows

To insert a new row, select an existing row and use the **Insert Row** button in the think-cell context menu. Alternatively, press Alt+Insert. If all other rows are deleted, there is still the extra row left at the very bottom of the chart which you can click to open the context menu and create new rows.

The keyboard shortcut Alt+Insert also inserts new rows while editing labels, and the first label of the newly inserted row is automatically selected. This way you can

add rows and keep typing without reaching for the mouse. Likewise, you can use Alt and the cursor keys ← → ↑ ↓ to move the cursor across labels.

You can also use the **Delete** button in the think-cell context menu to delete an entire row. The keyboard shortcut for deletion is Delete.

Row features

Each row not only contains timeline items – bars, process arrows, milestones, brackets – but can also have up to three labels, a horizontal separator line, and row shading. The labels and decorations are added and removed using the think-cell context menu. To open the menu, move the mouse *outside* of the chart's date range area and right-click on a row when it highlights.

Note: When you right-click a row *inside* the chart's date range area, another menu opens that allows for insertion of new timeline items. Refer to Adding items on page 72 for more information.

The row's context menu offers the following buttons. You can apply all of these buttons to one or multiple selected rows:

Delete (Shortcut Delete) Delete the selected row.

Insert Row (Shortcut Alt+Insert) Insert a new row after the selected one. If the selected row is the one below the chart's bottom line, the new row is inserted before.

Add Activity Label Column (Shortcut F2) Add or remove the activity label column. A headline for the column is added which you can overwrite or remove if necessary. With F2 you can edit the selected row's activity label.

Add Responsible Label Column Add or remove the responsibility label column. A headline for the column is added which you can overwrite or remove if necessary.

Add Remark Label Column Add or remove the remark label column. A headline for the column is added which you can overwrite or remove if necessary.

Add Row Shade Add or remove shading. You can change the shading's color and also add or remove the shading using the fill control in the think-cell toolbar. Shading works also well for multiple successive rows.

Add Row Separator Add or remove a separator line above the selected row.

Row labels

Each row supports up to three labels, resulting in up to three text columns next to the actual timeline. The default headlines for the three columns are language dependent (see Language dependency on page 76), with "Activity," "Responsible" and "Remark" used as the default English headlines. You are free to overwrite or remove them if necessary.

The labels to the left are intended for names of activities. These labels are shown by default and each label belongs to exactly one row. If you already have the text for the labels available in some other place where you can copy them to the clipboard, you can quickly paste an entire label column (see Pasting text into multiple labels on page 36).

Note: Unfortunately, selecting multiple shapes in PowerPoint or labels in another Gantt chart does not work in this regard. Lines of text in a word processor, text editor or email or multiple cells in an Excel worksheet can be copied to the clipboard and pasted into activity labels as described above.

You can organize activity labels in a hierarchy using PowerPoint's **Decrease/Increase List Level** buttons in the **Paragraph** ribbon group on the **Home** tab or hold down ⇧Shift+Alt and use the arrow keys ← and →. The vertical space between indented labels is reduced to show that they are grouped.

You can add up to two more columns if required. The labels for the headlines are automatically added when a column is created. The labels in the additional columns can refer to multiple rows (see Labels spanning multiple rows on this page).

Initially, a newly created label column is empty except for its headline. Move the mouse over the label column to discover label placeholders, which you can select just as any other features in think-cell. Use the placeholder's context menu to create either a text label, or a checkbox, or a Harvey ball. To quickly create a text label, you can simply select a placeholder and start typing. Similarly, you can recreate the headline labels, if you deleted them.

The row label's context menu shows the following buttons:

Delete (Shortcut Delete) Delete the selected label.

Switch to Checkbox Use a checkbox instead of a text label (see Checkbox and Harvey ball on page 79). If the selected label already contains text, the text will be discarded.

Switch to Harvey ball Use a Harvey ball instead of a text label (see Checkbox and Harvey ball on page 79). If the selected label already contains text, the text will be discarded.

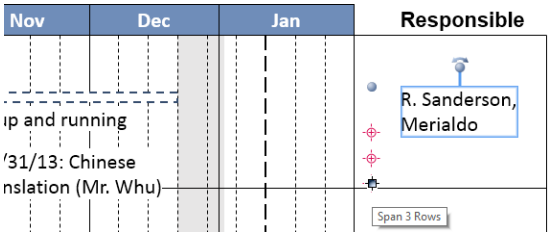
Switch to Text Label (Shortcut F2 or start typing) Use text for this label. Select and overwrite the placeholder text that is inserted when you click this button.

Add Bracket Add or remove the selected label's bracket. Brackets are added automatically to labels that span more than one row (see Labels spanning multiple rows on the current page). This option only applies to responsibility and remark labels. Since activity labels always refer to precisely one row, these labels do not need brackets.

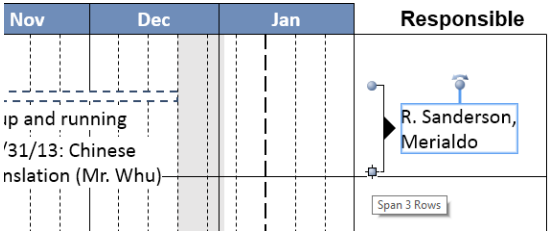
To remove a label, use its context menu or simply delete all text from the label – it will then disappear. To remove multiple labels at a time, it is often convenient to select all desired labels using the mouse together with ⇧Shift or Ctrl keys (see also Multi-selection on page 18). Then, choose the delete option from the context menu, or press the Delete key to remove all selected labels.

Labels spanning multiple rows

In both responsibility and remark columns, each label can refer to more than one activity. Drag the handles that appear next to the label when you select it, to determine the activities it refers to. You can only drag a label's handles across rows that do not already have a label in the same column, and you cannot drag the handles across horizontal separators.



A bracket will automatically appear as soon as a label spans more than one row. In this case, you are free to remove the bracket by selecting it and pressing Delete, or via the bracket's or the label's context menu.



Timeline items

There are several types of items used in a project timeline to visualize periods of time and events. The following items are supported by think-cell:

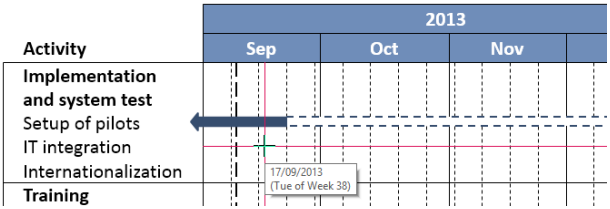
- **Bars** show the duration of some activity.
- **Process arrows** are similar to bars but contain text. They grow and shrink vertically with the amount of text they contain. To create an aesthetically pleasing layout, all process arrows of a Gantt chart are resized to the same height, if possible.
- **Milestones** mark singular events.
- **Brackets** are used to label periods of time which typically comprise multiple activity bars.
- **Shades** are used to visualize non-working times such as weekends or holidays. They are usually labeled by an additional bracket below the chart.

Adding items

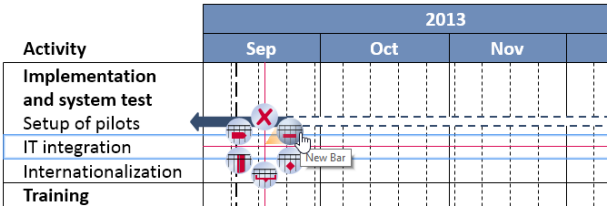
To add an item to the chart, move the mouse across the chart's date range area. A crosshair helps you to track the row and date you are pointing at, and a tooltip provides precise date information.

The dates that can be selected depend on the chart's date range and size, and on your current zoom level. If days are too small to be pointed at individually, the crosshair snaps to firsts of weeks and firsts of months. If even weeks are too small to be distinctively selected, the crosshair only snaps to the beginning of months.

Wherever the crosshair appears, it is possible to insert a new item. When you move the mouse over existing items, the crosshair disappears and the tooltip reflects that item's date or date span.



With the crosshair highlighting, click the right mouse button to open the context menu.



Note: If you want to open the row's context menu to insert a new row or to add some row label or decoration, you must right-click on the row *outside* the chart's date range area. Refer to Row features on page 70 for more information.

The context menu for insertion shows the following buttons:

Delete (Shortcut Delete) Delete the selected row, separator line, or milestone line.

New Bar Create a new activity bar beginning at the crosshair position.

New Milestone Create a new milestone at the crosshair position.

New Bracket Create a new bracket beginning at the crosshair position.

New Shade Create a new shade beginning at the crosshair position.

New Process Create a new process arrow beginning at the crosshair position.

Note: You can also create new items by clicking and dragging existing items while holding down the Ctrl key. A copy of the original item is created at the new location.

Moving items

There are several ways to move existing items to another date or row. Obviously, you can drag one or multiple selected (Multi-selection on page 18) items with the mouse. If exactly one item is selected, you can also drag its handle(s) to adjust the date, or anchor it to another item (see Anchoring items on the next page).

You may double-click an item to open the **calendar dialog** for easy date selection. The current date of the selected item is pre-selected. For bars, process arrows, brackets and shades, select a date range as described above (Modifying the date range on page 66). For milestones, simply click on the desired date; the calendar dialog will close immediately and the selected date will be applied.

Milestone positioning

Bars and process arrows are positioned to begin at 0:00h on the start date and to finish at 24:00h on the end date. The default position of milestones, however, depends on the currently viewed date range and the visible scales:

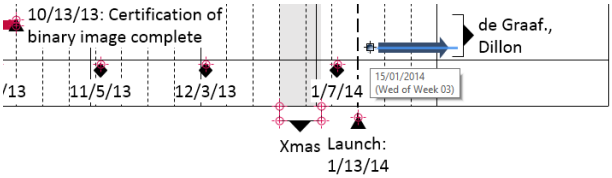
- If the day scale or the vertical day separator lines are visible, then milestones are positioned at 12:00h on the appropriate day;
- If the day scale and the vertical day separator lines are not visible, then milestones are positioned at 0:00h on the appropriate day.

The default positioning of milestones is usually correct but can be overridden, if required, by the use of anchors (Anchoring items on the next page). Anchoring a milestone to the end of a bar, for example, will ensure that

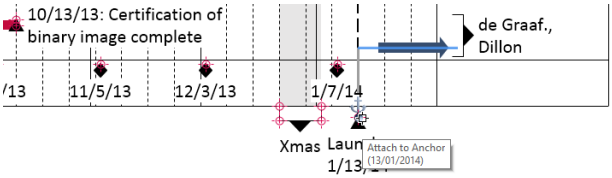
the milestone is always aligned with the end of the bar, regardless of the currently viewed data range or visible scales.

Anchoring items

Using the handles of bars, process arrows, milestones, brackets and shades, you can attach these items to other items. When you click a handle with the mouse, the available *anchors* highlight. Drag the handle within the current row to set the selected item's date manually, or drag the handle onto an anchor of some other item to attach it to that item.



Items remain anchored while they are being edited. For instance, when you anchor a milestone to the end of a bar, this connection enforces that the milestone is always at the same date as the end of that bar. In particular, whenever you move the bar afterwards, the location of the milestone will be updated accordingly.



For another example, inserting a shade implicitly creates an additional bracket which is anchored to the shade. When you move the shade, the attached bracket moves along. Still, you can detach the bracket, move it to a different location, or delete it.

Note: Items can be anchored across different rows. When you drag an item's handle, the date changes but the item remains in its row. To move an item to a different row, drag the item itself, not its handles.

Changing the chart's appearance

You can change the color of bars, process arrows, milestones and shades using the color control in the floating toolbar (Color and fill on page 19). The background color of the chart can be changed by selecting the whole chart and choosing the desired color from the floating toolbar.

By way of the context menu, you can further configure the appearance of timeline items. The context menu for timeline items comprises the following buttons (depending on the type of the selected item):

Delete (Shortcut Delete) Delete the selected item.

Open Calendar (Shortcut double-click) Open the calendar dialog for the selected item (refer to Moving items on the previous page).

Set Solid/Dashed Toggle the appearance of the selected bar or process arrow between solid and dashed.

Add Date Label (Shortcut F2) Add or remove a label for the selected item. By pressing F2, you can edit the label's item, or create it if it does not yet exist. By default, the label contains the item's date which is updated when the item moves (see also Item labels on the following page).

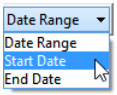
Set Diamond/Triangle Shape Toggle the shape of the selected milestone between triangle and diamond.

Add Milestone Line Add a milestone line to the selected milestone.

Item labels

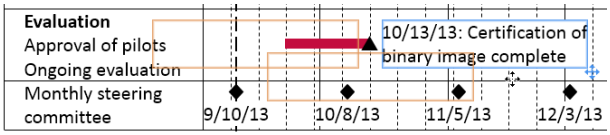
Bars, process arrows, milestones and brackets can have labels, while shades are usually labeled by means of an additional bracket below the shade. Use the think-cell context menu to add a label to one or more selected items. If exactly one item is selected, you can press F2 to add a label to this item or edit an existing label.

By default, an item label contains the item's date or date span. This information is maintained in a text field (see Text fields on page 34) and is updated whenever the item is moved. You can add text to the label or replace the default content with custom text.

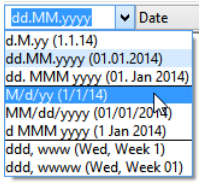


If you deleted the text field you can always re-insert it into the label. Select the label and choose the desired field from the label content control in the context-sensitive toolbar (refer to Label content on page 36).

In particular, think-cell allows for large multi-line labels even in a relatively dense chart. All activities are automatically arranged to make the text fit. Moreover, most labels can be dragged to place themselves below or besides their respective item.



Date format control



You can freely set the desired formatting for date values that appear throughout the labels of a project timeline. By convention, all item labels of a chart share the same date formatting, so when you change the formatting for one label, all others will change accordingly.

When you select a label that contains a date field, or select a date field within a label, the date format control appears in the floating toolbar. It works similar to the number format control (see Number format on page 35).

The dropdown menu facilitates one-click selection of the most commonly used date formats. Its contents depend on the feature that is selected, e.g., each scale offers a different set of predefined date formats.

The edit box reflects the current setting and allows entering of arbitrary date formatting. The format codes used by Excel and Graph are supported, and some more codes were added for the particular purposes of the project timeline (see table below). Also, up to four of your most recently used custom formattings are available in the dropdown box.

Date format codes are case-insensitive. You can insert a line break with the backslash character \.

You can mix the format codes with arbitrary text and delimiters. If your custom text contains characters that can be interpreted as format codes, i.e., `d D w W m M q Q y Y \`, you must enclose the text within single quotes `'`. It will then be displayed "as is."

To use the single quote character itself, type two single quotes `''`.

Language dependency

The project timeline chart is language dependent: The display of full or abbreviated month names, as well as names for weekdays, the default headlines for the activity labels and the default text for scale labels, depend on the proofing language setting for Office. This setting's value is used at the time when the elements are inserted.

You can alter the language used for language dependent elements as follows:

1. Alter the setting to the desired language by
   a) clicking into a text box,
   b) choosing **Review > Language > Set Proofing Language...**,
   c) selecting the desired language in the dialog,
   d) clicking on **Default...** and confirming with **Yes**,
   e) closing the dialog with **OK**.
2. Use the appropriate context menu to remove and then re-add the language dependent labels that you wish to update.
3. Use the **Scales** menu to first hide and then re-show the scales that you wish to update.

Date format codes

Code	Description	Example
`d`	day of month	5
`dd`	day of month (two-digit)	05
`ddd`	day of week (abbrev.)	Mon
`dddd`	day of week (full)	Monday
`ddddd`	day of week (single character)	M
`w`	week of year	7
`ww`	week of year (two-digit)	07
`M`	month number	9
`MM`	month number (two-digit)	09
`MMM`	month name (abbrev.)	Sep
`MMMM`	month name (full)	September
`MMMMM`	month name (single character)	S
`q`	quarter (decimal number)	4
`qq`	quarter (upper-case roman number)	IV
`qqq`	quarter (lower-case roman number)	iv
`yy`	year (two-digit)	04
`yyyy`	year (four-digit)	2004
\ (Backslash)	line break, e.g., `ddd\dd`	Mon 05
`'...'`	Insert custom text, e.g., `'Quarter' qq`	Quarter IV
`''`	The actual single quote character, e.g., `'W'ww''yy`	W07'04

Layout

14. Introduction to layout

In addition to elements for charting, think-cell provides a growing number of elements and tools for general slide layout and for enhancing productivity when working with PowerPoint. Basic elements can be used to create complex structures to support the message you want to communicate with a slide (see Basic elements on the following page). The agenda tool automatically maintains contents and chapter slides that are always up-to-date (see Agenda on page 81). And a number of additional productivity tools make several tasks more efficient when working with presentations (see Presentation tools on page 86).

15. Basic elements

Pentagon/Chevron

Icon in Elements menu:

The pentagon/chevron is often used to describe processes and their sequential steps. If this element is selected, e.g., immediately after insertion, you can start typing and the text will be displayed inside the element with automatic line breaks. By double-clicking a pentagon you can convert it into a chevron and vice-versa.

The appearance of the pentagon/chevron is controlled by the fill color, outline color and outline style controls in the floating toolbar. See Formatting and style on page 19 for details on these controls.

When moving or resizing a pentagon/chevron, snapping helps you to align a new element with existing objects on the slide. Additionally, you can select multiple pentagons and chevrons, e.g., having the same height and showing a process flow, and change the height of all elements at the same time.

Rounded Rectangle

Icon in Elements menu:

If a rounded rectangle is selected, e.g., immediately after insertion, you can start typing and the text will be displayed inside the element with automatic line breaks.

The appearance of the rounded rectangle is controlled by the fill color, outline color and outline style controls in the floating toolbar. See Formatting and style on page 19 for details on these controls.

Checkbox and Harvey ball

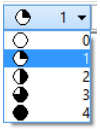
Icon in Elements menu:

In both responsibility and remark columns of a Gantt chart, you can choose to display a checkbox or a Harvey ball instead of a text label, using a row label's context menu (see Row labels on page 70). You can also use these elements outside of a Gantt chart, however. In that case, use the **Elements** menu in the think-cell toolbar.

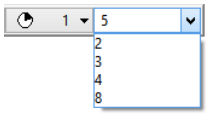
Select the feature to configure its appearance using the floating toolbar. Use the font size control (see Font on page 35) to adjust the size of the feature, and use the color control to change its primary or outline color (see Color and fill on page 19). For checkboxes, you can

also change the style of the outline (see Line style on page 21).

When you select a checkbox, an additional control becomes available in the toolbar, which you can use to change the checkmark symbol. You can also quickly change the symbol by double-clicking the checkbox, or by pressing the associated key on your keyboard; e.g., V for "check" or X for "cross".



When you select a Harvey ball, an additional control becomes available in the toolbar, which you can use to change the Harvey ball's completion state. You can also quickly increase the Harvey ball's state by double-clicking it or pressing + on your keyboard and decrease the Harvey ball's state by pressing - on your keyboard. Additionally, you can directly set the number of completed Harvey ball fractions by entering it with the keyboard. If the number of fractions is larger than 9, use the keys 1 to 8 to fill one eighth of all fractions or two eighths, three eighths and so forth.



Next to the control you will find another control with numbers. These numbers indicate the number of fractions of the Harvey ball. You can manually add your own values by entering them in the box.

16. Agenda

Using the agenda element you can manage the agenda of your presentation, create a table of contents and add or rearrange individual chapters. All agenda slides are automatically kept in sync as you edit the presentation.

Inserting a chapter

To start a new chapter of your presentation, choose **Chapter** from the **Elements** menu. A new slide is inserted after the current slide which contains a new line "Chapter". The new line is selected, so you can immediately type the name of the new chapter, overwriting the placeholder text. The new slide is by default titled "Agenda" which can be changed if desired (see Role Model on page 84).

Reordering agenda chapters

While editing an agenda slide you can change the order of chapters using the following methods:

- select a chapter heading, then press Alt+Insert to insert a new chapter,
- select a chapter heading, then hold Shift ⇧+Alt and use ↑ ↓ to move the current chapter up or down,
- drag the chapter heading to a new location using the mouse or
- drag while holding Ctrl to duplicate the chapter.

If you move a chapter, slides belonging to that chapter are moved along, i.e., all slides between the agenda slide of the moved chapter and the agenda slide of the following chapter.

In the slide sorter view you can reorder agenda slides or copy, paste and duplicate them in the same manner as normal slides. If you change the order of chapters, all agenda slides are updated accordingly.

Placing the agenda

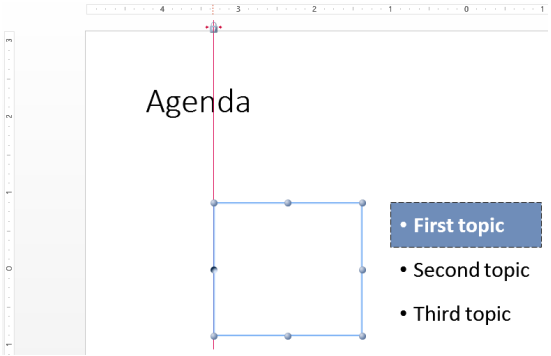
The agenda element is centered on the slide if you do not change the placement. To move it, you can lock the top, bottom, left or right edge to a specific position.

For example, if a logo or image is displayed on the left side of every agenda slide, you can lock the left edge to leave enough space between logo and agenda and the agenda element will grow to the right to accomodate longer chapter headings. You should choose the

correct agenda placement after inserting the first chapter slide, as subsequent chapter slides will then use the same placement automatically.

First, you need to select the whole agenda element. Position the mouse pointer so that all chapter headings are surrounded by an orange boundary and click once. Alternatively, use PowerPoint's lasso selection to include all chapter headings. Afterwards, the whole agenda is highlighted with a blue boundary and every edge shows three handles: at both ends and in the center.

With the agenda element handles showing, you place the agenda by dragging one of the handles to the desired position along one of PowerPoint's rulers. Drag one of the handles and a drag target appears at a position along, but slightly to the right of the left ruler or slightly below the top ruler. When you move the mouse to this position a red helper line and a lock icon will appear while dragging along the ruler. Once you release the mouse button, the edge is locked at that position.



The size of the agenda element is always determined dynamically, depending on the length and number of chapter headings. Therefore, you should lock two edges of the agenda element at most, so that in can grow and shrink by placing the other edges dynamically.

To change the position of a locked edge, drag the lock icon to another position. To unlock an edge and let think-cell place the agenda automatically again, simply drag the lock icon away from the ruler.

Multi-level hierarchy of chapters

The chapter hierarchy is determined by text levels. PowerPoint provides several ways to change these. You can use PowerPoint's demote and promote buttons or hold down Shift ⇧ + Alt and use the arrow keys ← and →.

Lower-level chapters will only be shown on chapter slides of the same level and on the slide of the parent chapter. If a chapter with hidden sub-chapters is selected, a marker » is shown below the beginning of the heading text. Clicking this double arrow takes you to the first chapter slide that shows the hidden sub-chapters.

Agenda slides will be hidden during the slide show if there are no slides between a chapter and its first sub-chapter, i.e., the main chapter does not have content of its own. This avoids having to fast-forward chapter slides until you reach the actual content during slide shows. It is achieved by automatically setting PowerPoint's "Hide Slide" attribute.

For example, when a chapter "A" contains a sub-chapter "A1", and there are no content slides between the agenda slides for "A" and "A1", then the agenda slide for "A" is automatically set to "hidden" in PowerPoint. Similarly, when the condition no longer holds, the slide is automatically "unhidden" in PowerPoint.

During slide shows, a displayed slide number will jump whenever a hidden agenda slide is omitted. To prevent this, choose **Remove Hidden Agenda Slides** from the context menu of any chapter heading to remove all such slides from the presentation. To add content between a removed chapter slide and the first sub-chapter slide, choose **Insert Hidden Agenda Slides** and navigate to the desired location in the presentation.

Multiple agendas in a single presentation

It is possible to divide the presentation into multiple sections, each with its own agenda. To do this, go to the first slide of the second section and choose **Split Agenda** from the **Elements** menu. A slide can be identified as a divider slide by a marker in its top left corner.

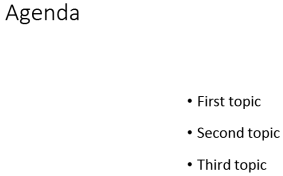
Chapters after a divider are not included in agenda slides before the divider and vice versa. The different sections in the presentation have independent agendas.

Typically, a divider is used to separate a backup section from the main part of the presentation. In this case, usually the backup section has it's own title slide, which just says "Backup" (with no agenda or overview on it). This is where the agenda divider should be placed. The chapters after this slide do not appear on agenda slides at the beginning of the presentation and the backup slides are not moved along when moving the last chapter of the main part of the presentation.

Note: If you place the agenda divider on the first agenda slide in the backup, the divider would be moved along if you move this chapter later and would also be duplicated if you duplicate the agenda slide.

Inserting a table of contents

To add a slide showing all top-level chapters without any highlighting, choose **Table of Contents** from the **Elements** menu. If you have not yet defined any chapters, the slide will be empty, and will be populated when you add chapters. An example is shown below:



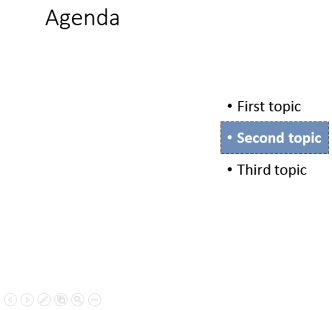
If the presentation already contains chapter slides, the contents slide will be inserted before the first chapter slide. If there are no chapter slides yet, an empty contents slide will be inserted after the current slide. Simply use PowerPoint's slide sorter view to move it to the desired position.

Styling the agenda

When a chapter heading is selected, the floating toolbar offers controls for changing the font size and style (see Font on page 35), the fill (see Color and fill on page 19) and the style of the outline (see Line style on page 21). When an outline is used, you can also change its color.

The styling of a chapter heading is used for all chapters of the same type. For example, if you assign a blue fill and dashed outline to a highlighted top-level chapter

heading, all other highlighted top-level chapters will be styled in the same way.



When styling the agenda, think-cell differentiates between the following types:

- chapter is current and at top level
- chapter is top-level and contains the current chapter
- chapter is top-level but does not contain current chapter
- chapter is current but not at top level
- chapter is an immediate child of current chapter, and current chapter is top-level
- neither chapter nor current chapter are top-level, and chapter is not on the path from the top-level chapter to the current chapter, but either one of its siblings is on this path or it is an immediate child of the current chapter (chapter is "in subtree of current")
- chapter is not top-level and not current and not "in subtree of current", but the top-level chapter of this chapter is current
- chapter is not top-level and not current and not "in subtree of current", but this chapter is below the same top-level as the current chapter
- any other chapter (except table of contents)
- chapter is in table of contents, and chapter is top-level
- chapter is in table of contents, and chapter is not top-level
- neither chapter nor current chapter are top-level, and chapter is on the path from the top-level chapter to the current chapter

Tips and Tricks

You can use all four arrow keys for chapter shortcuts: Shift ⇑+Alt and ↑ ↓ for reordering chapters and Shift ⇑+Alt and ← → for changing the hierarchy level.

In slide view, double-clicking a chapter heading takes you to the associated agenda slide. A single click accomplishes the same during a slide show.

Selecting a chapter heading and changing the font size and style using the floating toolbar applies the same change to all other chapters of the same type. However, selecting part of the chapter heading text and using PowerPoint's controls, e.g. for italicizing a proper name, will change this chapter's text on all agenda slides but will not affect other chapters.

Role Model

When the second and any subsequent agenda slide is inserted in a presentation, it is created as a copy of the closest existing agenda slide, including shapes on the

slide and the master setting. Thus, if the user has applied a specific slide master or custom layout (PowerPoint 2007 and later) to an agenda slide, this setting is inherited by all agenda slides that are created later.

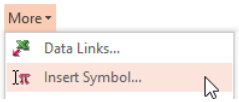
17. Presentation tools

This chapter explains various small tools of think-cell that can make life a lot easier.

Special characters

Experienced PowerPoint users find the built-in **Insert** → **Symbol** tool inconvenient for frequent use. With think-cell installed, there is a simpler way to insert special characters.

Open the **Insert Symbol** dialog from the **More** menu in the think-cell toolbar.



You will find all the symbols you need on a single page, grouped by usage context. Now, with a click of the mouse, you select the desired character or symbol and the character is inserted at the cursor location.

Note: If no shape or text label is selected, the think-cell special character dialog has no effect. If you have one shape or text label selected, it will be switched to text editing mode.

Save and send selected slides

Sometimes it is useful to save parts of a set of slides. With think-cell you no longer need to duplicate the file and then delete unwanted slides. Simply select the desired slides from the outline pane on the left or from the slide sorter view, click on **More** from the think-cell toolbar and choose **Save Selected Slides**.... After the new file is created, it is immediately opened for editing.

If you want to send the selected slides by e-mail, you can also choose **Send Selected Slides**... and an e-mail template with attachment will be composed in your default e-mail application.

The files created by using **Send/Save Selected Slides**... contain a time stamp conforming to ISO 8601 in the file name to make them globally unambiguous. The file `Presentation1 slides 2-3 20110121T1556+01.ppt` would contain Slides 2 through 3 from `Presentation1.ppt` and was sent or saved on January 21, 2011 at 15:56 in time zone UTC+1. "T" separates date and time.

Changing the language

Setting the language correctly is crucial if you wish to use PowerPoint's spell checker. think-cell adds extra options

to let you change the language of the text in a slide or in a complete presentation. These options can be found in the **Language** menu item in the **Review** tab.

Simply select the desired language in the dialog and click either on **Text on Slide** to change the language of all text on the current slide or on **All Text** to change the language of all text in the presentation.

Changing fonts

Changing the font of text within a large presentation can be a lot of work. think-cell's **Replace Fonts**... tool can be used to greatly simplify the task. The tool can be accessed in the **Format** menu of PowerPoint or the **Editing** group on the **Home** tab of the PowerPoint ribbon. It replaces PowerPoint's **Replace Fonts** dialog. The drop down boxes in the dialog can be used to select the font to replace and the new font, and the font size can also be optionally adjusted. Select the scope for the changes (either **Entire presentation**, **Current slide** or **Selection**) and then click **Apply** to replace the fonts or click **OK** to close the dialog as well.

Automatic case code

You can add a textbox to the master slide that always shows the file name or, alternatively, file path of the presentation. If the file name is the same as the case code used to identify a project in your organization, you can use this textbox to show the case code on each slide. The content of the textbox is updated whenever the file is saved under a different name.

To add a textbox that shows the case code, follow these steps:

1. Switch to the master slide view (menu **View** → **Master** → **Slide Master**).
2. Insert a new textbox and place it on the master slide. You may need to insert dummy text to keep it from being removed immediately again. The dummy text will be replaced by the case code when the file is saved.
3. In PowerPoint 2007 and later
   a) Right-click the textbox and open the **Size and Position** dialog.
   b) Go to the **Alt Text** tab and find the input area for **Alternative text** or, in PowerPoint 2010, 2013, and 2016, for the **Description**.

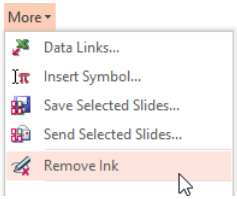
   In earlier PowerPoint versions
   a) Open the Format Text Box dialog (double-click the textbox or select **Format Text Box** from the context menu).
   b) Go to the **Web** tab and find the input area for **Alternative text**.
4. In the input area, type in the following:
   - `casecode` to have the filename automatically displayed in the textbox;
   - `CASECODE` to have the capitalized filename automatically displayed in the textbox;
   - `casepath` to have the full file path automatically displayed in the textbox;
   - `CASEPATH` to have the capitalized full file path automatically displayed in the textbox.

As soon as you save the file, the case code shows up on the slides.

Note: The case code textbox only works on the master slide, not on individual slides.

Remove Ink

If someone has used a Tablet PC to add ink annotations to the current slide, you can get rid of all ink on that slide with a single mouse button click. Simply use the option **Remove Ink** from the **More** menu.



Excel data

18. Excel data links

When the source data for your data-driven charts is available in Excel, you can create charts directly from the Excel application. When data in Excel changes, you can either update the charts on command or have think-cell do the update automatically.

Creating a chart from Excel

For a step-by-step guide on how to create a chart from your Excel data using think-cell, please consider the example from Introduction to charting on page 24. This is how the example chart data looks in Excel:

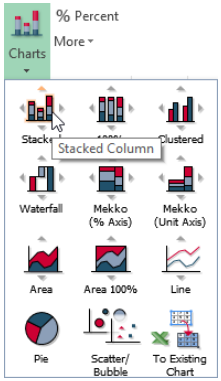
G	H	I	J	K
	2013	2014	2015	2016
	8.4	30.7	81.9	179.3
	18	65.3	174.1	381

To create a chart from Excel, select the desired data range in your Excel workbook, including series and category labels:

G	H	I	J	K
	2013	2014	2015	2016
	8.4	30.7	81.9	179.3
	18	65.3	174.1	381

The layout of your data must match the layout of think-cell's internal datasheet: Column charts are usually created from data columns, whereas bar charts are created from data rows. Nevertheless it is possible to transpose the data source (see Transposing linked data on the following page). In addition to the data, some cells to the left and on top are reserved for category and series labels. If you are unsure about the exact layout required, simply insert a new chart of the desired type in PowerPoint and refer to the layout of its datasheet.

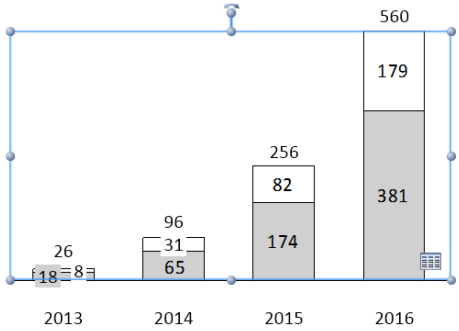
Then select the desired chart type from the **Charts** menu in Excel's think-cell toolbar:



When you click on this menu item in Excel, the PowerPoint window is activated. If PowerPoint is not yet running, it starts automatically. In PowerPoint, when the mouse pointer is on a slide, the familiar insertion rectangle appears.

Switch to the slide where you want to insert the chart, or insert a new slide, and place the chart as usual: Click once to accept the default size or click, hold and drag to change the chart's initial size. For a detailed description on how to place, resize and align a new chart, please refer to Inserting a new chart on page 24.

After insertion, the chart looks and behaves like a regular think-cell chart that has been created in PowerPoint:



Please refer to Adding and removing labels on page 25 and Styling the chart on page 26 to learn how to configure and style the chart.

As well as creating a new chart, you can link a selected data range in your Excel workbook to an existing chart in a PowerPoint presentation. Simply click the **To Existing Chart** button from the **Charts** menu in Excel's think-cell toolbar and click on the chart in PowerPoint that you wish to link to.

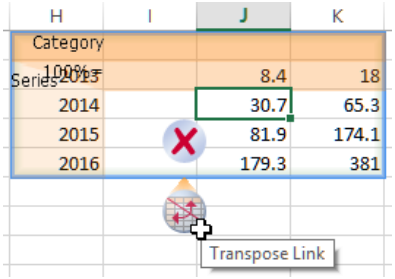
Note: Text fields in PowerPoint can contain up to 255 characters. Any additional text from the Excel data source will be truncated. See Text fields on page 35

Transposing linked data

Having linked a data range to a chart, you can alter how the data is interpreted using the **Transpose Link** button in the think-cell context menu of the data range. Transposing a data range swaps the chart's row and column data interpretation, letting you, for example, create column charts from rows rather than columns of data.

1. Select the green boundary around the data range.

2. Right-click on the boundary to invoke the context menu.
3. Select the button **Transpose Link**.



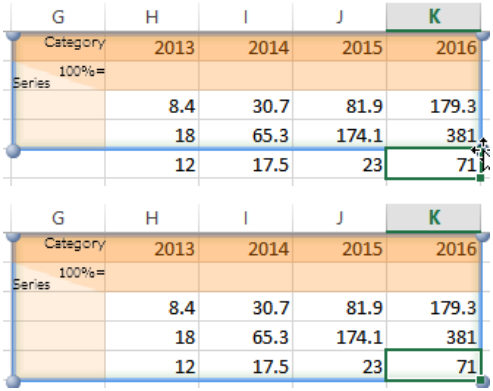
Note: Transposing a linked data range does not swap the data in the rows and columns.

Updating a linked chart

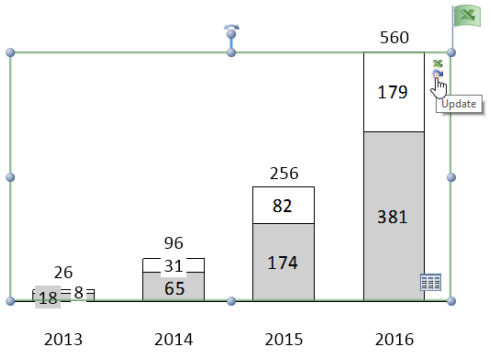
The most important function of a chart that is linked to an Excel workbook is the option to update the chart according to changes in the underlying data. In our example, we want to add a third data series. Double-click the chart to switch to the linked data range in Excel. Enter the additional data below the linked range:

G	H	I	J	K
Category	2013	2014	2015	2016
100%= Series				
	8.4	30.7	81.9	179.3
	18	65.3	174.1	381
	12	17.5	23	71

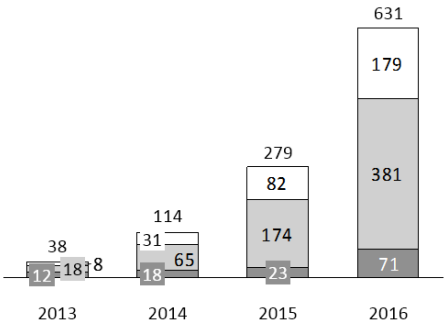
Then, select the linked range by clicking on its border to show the familiar think-cell user interface. Drag a corner of the selection to include the newly entered data:



Finally, return to PowerPoint. When selecting the linked chart, it is flagged to indicate that an update of its linked data has been detected:



Click the **Update** button next to the flag to incorporate the data changes from Excel in the chart. The chart is updated and the flag disappears:



After pressing **Update**, this button changes to **Revert**. Click it to take back the changes you just made. The **Revert** button is available until the PowerPoint file is closed or the Excel data source changes again. In the later case, it is replaced by the **Update** button.

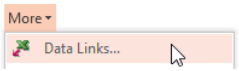
Even if the chart is not updated, or is updated and then reverted again, the link to the Excel data source remains. Thus, you always have the option to update the chart later.

You can also let think-cell automatically update the linked chart for you. This option is available in the **Data Links** dialog (Data Links dialog on the current page).

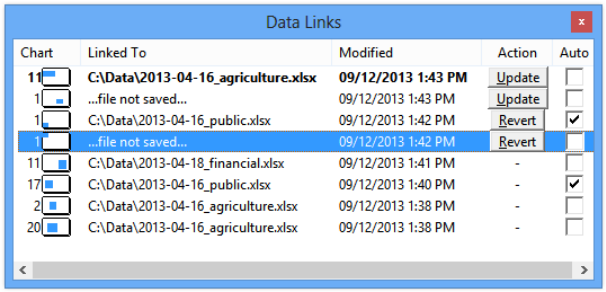
Note: Linking a chart to data in Excel using think-cell does not depend on the file names of the Excel or PowerPoint file. Each chart as well as each data range in Excel is assigned a unique identification number that is used to maintain the link. The technical requirement for reestablishing a link is that both the Excel file containing the data range and the PowerPoint file containing the chart are simultaneously open on the same computer, irrespective of the file names.

Data Links dialog

If you have a large number of charts in your presentation, finding and updating all linked charts manually is not practical. For a better overview and a more directed approach to update your charts, go to the **More** menu in the think-cell toolbar in PowerPoint and open the **Data Links** dialog:



The data links dialog shows all linked charts of the current presentation and their update states:



For each linked chart, the following information is available in the data links dialog:

- Slide number and a thumbnail that shows the position of the chart on the slide.
- Name of the Excel file that contains the linked data.
- Time stamp of the last modification of the linked data.
- **Update** or **Revert** button. The linked Excel file must be open for these buttons to be available.
- **Auto** checkbox, indicating whether or not the chart is being updated automatically as soon as changes in the linked data are detected.

– The chart entry appears in **bold** when an update is pending.

You can leave the data link dialog open while you continue editing your slides and data. Using the data links dialog, you can efficiently manage all linked charts and their data sources:

– **Click on the heading** of any of the described columns to sort the list of charts by that column.
– **Single-click on a row** to select the chart (in Normal view) or the slide (in Slide Sorter view).
– **Double-click on a row** to create the same effect as a double-click on the chart itself: The linked Excel workbook is opened and the linked data is selected. If the data source is not available, the internal datasheet is opened instead.

The **Update** and **Revert** buttons are the same as the ones in the upper right corner of the chart: Click the **Update** button to incorporate data changes from Excel in the PowerPoint chart. Click **Revert** to undo the update and return to the chart's previous state. You can also click **Revert** to undo the latest automatic update.

Check the **Auto** checkbox to let think-cell automatically update the chart whenever changes in the linked data are detected. The chart is not highlighted or flagged, but you still have the option to manually revert the automatic update. Change detection works only while both files, Excel and PowerPoint, are open at the same time.

Note: If the linked Excel file for a chart is not available, and the internal datasheet is opened and edited, then automatic updating for the linked chart will be disabled. This ensures that any changes made using the internal datasheet are not automatically overwritten when the linked Excel file becomes available.

Update, **Revert** and changing the **Auto** setting all work on multi-selections as well. Use Shift ⇧-click to select a range of links, and Ctrl-click to toggle the selection of individual charts.

Maintaining data links

After the creation of a link between Excel data and a chart in PowerPoint, both Excel and PowerPoint files continue to be self-contained independent files:

– You can pass on or edit the files independently.
– You can rename the files. The data links will be reestablished as soon as the Excel and PowerPoint files are open at the same time. To store the information about the reestablished data links the files should be saved.
– You can copy and paste linked charts within the same presentation or even to another presentation. The copy of the chart will then be linked to the same data source as the original.
– You can send the Excel and PowerPoint files by e-mail. The data links will be reestablished as soon as the Excel and PowerPoint files are open at the same time on the computer of the receiver. To store the information about the reestablished data links the files should be saved.
– You can make copies of linked Excel files and use the copies as alternative data sources for the data links.

The original and copied Excel files can be independently edited. The link between a PowerPoint presentation and the desired Excel file will be established when opening one of either the original or the copied Excel files together with the PowerPoint file.

Note: When copies of the same linked range in Excel are present in open workbooks, e.g., after copying a worksheet, both copies are equally valid source ranges ("siblings") and it is undefined with which range the link will be established when opening the PowerPoint file. A warning is displayed next to affected linked ranges in Excel in this case and you can use the litte blue buttons displayed below the think-cell frame in Excel to switch between all siblings. You should then make all but one copy of the linked range unavailable, e.g., by closing the respective workbook. Alternatively, you can make all the linked ranges unique by deleting all but one of the think-cell frames in Excel and linking each range to the desired chart, respectively. This way, each new frame is assigned a unique identifier.

Editing linked files

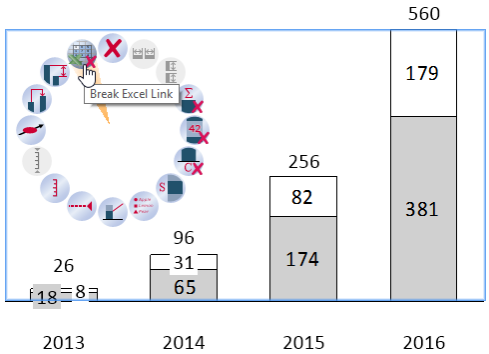
If you edit the PowerPoint file without the linked Excel file(s) being available, linked charts simply behave as regular charts with an internal datasheet. Using think-cell, you can change the chart's design and data without restriction.

Similarly, you can freely edit an Excel workbook without the linked PowerPoint file(s) being available. With think-cell installed, any linked data ranges that are not currently connected to an open PowerPoint presentation, are highlighted with a light red frame.

As soon as you open both the data source in Excel and the chart in PowerPoint at the same time, the link is reestablished. In Excel, the highlight of the linked data range changes from red to green. In PowerPoint, the chart's current data is compared to the data source. If changes are detected, the chart is highlighted in the data links dialog, and it is flagged when selected. You can now manually update the chart to the latest data from Excel.

Changing and removing links

To disconnect a chart from its linked data source, simply select the button **Break Excel Link** from the chart's context menu:



From that point on, the chart only uses the think-cell datasheet in PowerPoint.

Similarly, you can disconnect a linked data range in Excel from its charts: Select the linked range by clicking on its frame. When the frame turns blue, indicating a think-cell selection, right-click on it and select the **Delete** button. The think-cell frame is removed while the data itself remains untouched. Any linked charts

will no longer be able to connect to this data range as their data source, and will instead use their internal datasheets.

Note: You cannot undo the removal of a linked frame, but you can create a new link with an existing chart, when you need it (see below).

Whenever you remove one participant of a link, either the data range in Excel or the chart in PowerPoint, the other side does not get deleted with it. Charts in PowerPoint fall back to using their internal datasheets, and linked data ranges in Excel simply remain in place until they are explicitly removed. This is important because there may be other charts in other presentations linking to the same data source.

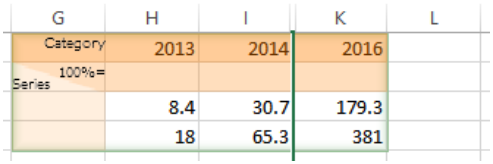
If you want to link an existing chart to an Excel data source, first go to the Excel workbook and select the desired data range. You can also select an existing linked range, indicated by the colored think-cell selection frame. Then switch to PowerPoint and select the desired chart. If the chart is already linked to some other data source, disconnect it as described above. Now the Excel link button in the chart's context menu has changed to **Establish Excel Link**. Click this button to establish a link from the selected chart in PowerPoint to the selected data range in Excel.

Note: If you want to remove all data links from a presentation, use the data links dialog (Data Links dialog on page 93). In the data links dialog, you can simply select all charts and press Delete to remove all links in a single action.

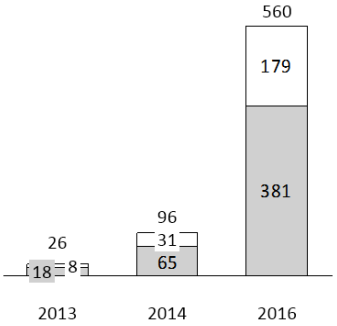
How to compile the data

When creating charts directly from Excel, you probably already have your data in Excel. In some cases, however, you may not wish to create a chart using all the data you have in your Excel sheet. Alternatively, the data may be in a fixed format that can not be easily altered. Here are a few suggestions that may help you in such situations:

- Add a new sheet to the Excel file and compile the data for your charts on this interface sheet. If you create this sheet using Excel references, then the data in the sheet and the linked charts in PowerPoint will be updated whenever the original referred to data changes. Using a dedicated sheet as the source for your charts also facilitates preparing the data specifically for the intended purpose. For example, you can use think-cell round to consistently round the data before presenting them in a chart (see Excel data rounding on page 101).
- You can simply hide entire rows or columns of data from being reflected in the chart by using Excel's **Hide** command. Keep in mind that the hidden data will appear in the chart as soon as you use Excel's **Unhide** command and update the chart.
- Similarly, you can use Excel's **Group and Outline** function to hide data that you do not want to be shown in the chart.



G	H	I	K	L
Category	2013	2014	2016	
Series 100%=				
	8.4	30.7	179.3	
	18	65.3	381	



Frequently asked questions

What are the advantages over Microsoft OLE?

You may be familiar with OLE (Object Linking and Embedding) in Microsoft Office. The idea is similar to think-cell's linking, allowing the creation of charts in PowerPoint that can later be updated with data changes from Excel. However, think-cell's linking technique has several advantages over OLE:

- The charts are always the same, whether they are linked or not. Even linked charts are native MS Graph charts, not Excel charts pasted into PowerPoint.
- Charts can be linked to Excel at any time, not only when they are created.
- Linked charts remain editable, even when the linked data source is not available.
- Links in think-cell are independent of the file name or path. Simply open both files and any existing links between the files are reestablished.

What happens when copying a linked chart?

You can copy a linked chart just like any other chart by duplicating a slide, duplicating the chart, Ctrl-dragging the chart or copy-pasting the chart to another slide or to another presentation. In fact, even making a copy of the presentation file is a way to copy a contained linked chart.

In any case, the original and the copy are indistinguishable. Both link to the same Excel data range and, if they are open simultaneously, will both receive an update when Excel data changes.

What happens when a linked chart is deleted?

When you delete a linked chart, the link in PowerPoint is removed together with the chart. If there is no other chart in an open presentation linking to the same Excel data range, the frame in Excel turns from green to red, indicating that the link cannot be established.

The linked data range in Excel is not affected in any other way by the deletion of a linked chart. After all, it is possible that a copy of the linked chart has been made, which, when opened, should reestablish its link.

How can I get rid of the red frames in my Excel worksheets?

Different coloured frames in the Excel worksheets indicate linked data ranges. A green frame indicates that a link has been established between the framed data range and a chart in an open PowerPoint presentation. In contrast, a red frame indicates that no linked chart is currently open. A red frame does not necessarily mean that there are no charts at all linking to that data range. It

just means that *in the currently open presentations* there are no such charts.

If you are sure that the framed data range is no longer required as a data source for any charts, you can remove the frame with the **Delete** button from the context menu. Together with the frame, the link information is removed from the Excel workbook. Any charts that are linked to the concerned Excel data range will not be able to establish their links in the future. Instead, they will use their internal datasheets.

The Excel data itself is not affected.

How can I see which charts in a presentation are linked, and where their linked data sources are?

If you are unsure about the data sources of the charts in a presentation, go to the **More** menu and open the **Data Links** dialog. This dialog displays a list of all linked charts in the current presentation. Click on an entry to display the corresponding chart.

The file name of the Excel file where the linked data range was last found is also available. The **Auto** checkbox indicates if the chart has been set to update automatically.

For a detailed description refer to section Data Links dialog on page 93.

What happens to a linked chart when its data source is unavailable?

When the Excel workbook that contains a chart's linked data range is not open and cannot be found in the same file location where it used to be, the chart cannot establish its link. Instead, it will use its internal datasheet, which always contains a copy of the linked data, and allow you to change the chart.

The internal datasheet of a linked chart is similar to the one of a regular chart. Even if there are multiple charts linked to the same Excel range, their internal datasheets are independent.

If you want to reestablish the link to the Excel data range, simply open the Excel workbook and the presentation with the linked chart at the same time. The chart in PowerPoint and the data in Excel will then automatically connect. When updating the chart with the linked data, any changes you made to the data in the internal datasheet will be overwritten.

How can I use the internal datasheet instead of the linked Excel data source?

To disconnect a chart from its linked data source, use the **Break Excel Link** button from the chart's context menu. From now on, the chart only uses the think-cell datasheet in PowerPoint.

You can remove the link from a chart, whether the linked Excel data range is currently open or not. For the Excel side of the data link, breaking the link of a chart has the same effect as removing the chart.

For further information read section Changing and removing links on page 95.

How can I enable or disable Auto-updating?

Go to the **More** menu and open the **Data Links** dialog. This dialog displays a list of all linked charts in the current presentation. The **Auto** checkbox determines if a chart is set to update automatically.

When selecting a chart in the presentation, the corresponding entry in the Data Links dialog will be selected, and vice versa.

For a detailed description refer to section Data Links dialog on page 93.

Why is my linked chart not updating although it is set to Auto-update?

The PowerPoint side and the Excel side of a data link can only connect when both files are open at the same time. Therefore, when the data in Excel is changed while the PowerPoint presentation is not open, and then the presentation is opened without the Excel workbook being open at the same time, the linked charts will not detect the changes in their data sources. As soon as the Excel workbook containing the linked data range is open, the link will be established and the changes will be detected. If the chart is set to Auto-update, it will update now. Otherwise, the chart will be highlighted in the Data Links dialog, and it will be flagged when selected. You can then decide whether you want to incorporate the changed data into the chart or not.

For more information read section Updating a linked chart on page 92.

Why is my linked chart indicating a pending update although the data in Excel did not change?

Whenever a link is established between an open PowerPoint presentation and an open Excel workbook, the data from the internal datasheet is compared to the linked data range. If they are not the same, the chart is flagged to indicate that an update is due. If Auto-update is enabled, it is updated immediately.

A pending update may also be detected when the data in the Excel workbook is unchanged, but the data in the internal datasheet has been modified. For a linked chart, the linked Excel data range takes priority over the internal data sheet. Therefore, an update will always overwrite any changes in the internal datasheet.

To protect you against data loss, whenever you make changes in the internal datasheet of a linked chart, Auto-update is disabled for the concerned chart.

How can I link an existing chart to a data range in an Excel workbook?

Go to the Excel workbook and select the desired range. Then switch to PowerPoint, select the desired chart, and click the **Establish Excel Link** button in the context menu.

For a detailed description, refer to section Changing and removing links on page 95. To learn how to insert a chart directly from Excel, read section Creating a chart from Excel on page 90.

My linked chart seems to ignore part of the Excel data range. Why?

In addition to the main data, the linked range in Excel contains some cells to the left and on top, which are reserved for category and series labels. If the selected range encloses only the main data, part of the data will be interpreted as labels and will not show up in the chart.

If you are unsure about the required layout, simply insert a new chart of the desired type in PowerPoint and refer to the layout of its datasheet.

For further information read section Creating a chart from Excel on page 90.

Why is Excel slow when I have lots of linked data ranges?

Excel performance can be improved by disabling automatic error checking. To do this, select from Excel's **Tools** menu **Options**, click on the **Error Checking** tab and uncheck the **Enable background error checking** box. For Excel 2007 and later go to the dialog **Excel Options**, select **Formulas** and uncheck the box **Enable background error checking** in the section **Error Checking**.

I have a lot of Excel files to visualize with think-cell. Can I run think-cell in batch mode?

It is possible to program think-cell. think-cell offers a function to create presentations from templates (see Programming think-cell on page 137).

19. Excel data rounding

When data is compiled for a report or PowerPoint presentation, rounding summations in Excel is a frequent problem. It is often desirable, but difficult to achieve, that rounded totals exactly match the total of the rounded addends. For example, consider the following table:

			Total:
4.3	15.3	21.4	41.0
10.5	7.6	3.7	21.8
17.5	18.3	19.5	55.3
11.5	17.4	20.9	49.8
43.8	58.6	65.5	167.9

When the values are rounded to integers using Excel's Format-Cell function, the following table results. Totals which appear to be "miscalculated" are in bold:

			Total:
4	15	21	**41**
11	8	4	**22**
18	18	20	**55**
12	17	21	50
44	**59**	66	**168**

Similarly, when Excel's standard rounding functions are used, totals of the rounded values are calculated correctly but rounding errors accumulate and results often deviate substantially from the actual totals of the original values. The following table shows the result of =ROUND(x,0) for the example above. Totals that deviate from the original value by 1 or more are in bold:

			Total:
4	15	21	**40**
11	8	4	**23**
18	18	20	56
12	17	21	50
45	58	66	**169**

Using think-cell round, you can achieve consistently rounded totals with minimal "cheating": While most values are rounded to the nearest integer, a few values are rounded in the opposite direction, thus maintaining correct calculations without accumulating rounding error. Since there are many possibilities to achieve correctly rounded totals by changing values, the software picks a solution that requires the minimum number of values changed and the minimum deviation from the

precise values. For example, rounding down 10.5 to 10 is preferable over rounding down 3.7 to 3. The following table shows an optimal solution for the above example, with "cheated" values in bold:

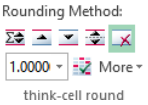
			Total:
4	15	**22**	41
10	8	4	22
18	18	**19**	55
12	17	21	50
44	**58**	66	168

To achieve this output in your own calculation, simply select the concerned range of Excel cells. Then, click the toolbar button and, if necessary, adjust the rounding precision using the toolbar's dropdown box.

Using think-cell round

think-cell round seamlessly integrates into Microsoft Excel, providing a set of functions that are similar to Excel's standard rounding functions. You can easily apply these functions to your own data using the think-cell round toolbar buttons.

In Excel 2007 and later the toolbars have been replaced by ribbons. The think-cell round ribbon can be found in the **Formulas** tab.



Rounding parameters

Like the Excel functions, the think-cell rounding functions take two parameters:

x The value that is to be rounded. This can be a constant, a formula or a reference to another cell.

n The rounding precision. The meaning of this parameter depends on the function you use. The parameters for the think-cell functions are the same as for the equivalent Excel functions. Refer to the table below for examples.

As in Excel, think-cell round can not only round to integer values, but to any multiple. For example, if you want to represent your data in 5-10-15-... steps, simply round to multiples of five.

In Excel, you must use different functions, depending on the desired rounding precision. Examples are the ROUND and the MROUND functions, which interpret the parameter n differently. Using the dropdown box in the think-cell round toolbar, simply type in or select the desired rounding precision. think-cell round chooses the appropriate function and parameters for you.

The following table provides some examples of rounding, using the toolbar, ROUND or MROUND together with their specific n-parameter.

Toolbar	100	50	2	1	0.01
ROUND	-2	-	-	0	2
MROUND	100	50	2	1	-
1.018	0	0	2	1	1.02
17	0	0	18	17	17.00
54.6	100	50	55	54	54.60
1234.1234	1200	1250	1234	1234	1234.12
8776.54321	8800	8800	8776	8777	8776.54

If the values are not displayed the way you expect them to, verify that the Excel Cell Formatting is set to **General** and the columns are wide enough to display all decimal places.

Button	Formula	Description
	TCROUND(x, n)	Let think-cell round decide to which of the two nearest multiples to round to minimize rounding error.
	TCROUNDUP(x, n)	Force rounding of x away from zero.
	TCROUNDDOWN(x, n)	Force rounding of x towards zero.
	TCROUNDNEAR(x, n)	Force rounding of x to the nearest multiple of the desired precision.
		Remove all think-cell round functions from the selected cells.
		Select or type the desired rounding multiple.
		Highlight all cells which think-cell decided to round to the farther of the two closest multiples instead of to the nearest.
		The turning wheel indicates that think-cell round is busy.

For optimal results with as little deviation from the underlying values as possible, you should use TCROUND wherever possible. Only use the more restrictive functions TCROUNDDOWN, TCROUNDUP or TCROUNDNEAR if you must.

Attention: You should never use nondeterministic functions like RAND() within any of the TCROUND formulas. If functions return a different value every time they are evaluated, think-cell round will make mistakes calculating values.

Layout of the calculation

The rectangular layout of the example above is only for sake of demonstration. You can use the TCROUND functions to determine the display of arbitrary summations spread across your Excel sheet. Excel's 3-D references to other sheets and links to other files do also work.

Placement of TCROUND functions

Since TCROUND functions are meant to control the output of a cell, they must be the outermost function:

Bad: =TCROUND(A1, 1)+TCROUND(SUM(B1:E1), 1)
Good: =TCROUND(A1+SUM(B1:E1), 1)

Bad: =3*TCROUNDDOWN(A1, 1)
Good: =TCROUNDDOWN(3*A1, 1)

If you happen to enter something along the lines of the *bad* examples, think-cell round will notify you with the Excel error value `#VALUE!`.

Limitations of think-cell round

think-cell round always finds a solution for arbitrary summations with subtotals and totals. think-cell round also provides sensible solutions for some other calculations involving multiplication and numerical functions. However, for mathematical reasons, the existence of a consistently rounded solution cannot be guaranteed as soon as operators other than +, - and SUM are used.

Multiplication with a constant

In many cases, think-cell round produces good results when constant multiplication is involved, i.e., at most one of the coefficients is derived from the result of another TCROUND function. Consider the following example:

	A	B	C
1	=TCROUND(1.3, 0)	=TCROUND(1.4, 0)	=TCROUND(3*A1+B1, 0)

The precise calculation for cell C1 is $3\times1.3+1.4=5.3$. This result can be met by rounding up the value 1.4 to 2:

	A	B	C
1	1	2	5

However, think-cell round can only "cheat" by rounding up or rounding down. Further deviation from the original values is not supported. Thus, for certain combinations of input values, no consistently rounded solution can be found. In this case, the function TCROUND evaluates to the Excel error value `#NUM!`. The following example illustrates an unsolvable problem:

	A	B	C
1	=TCROUND(1.3, 0)	=TCROUND(1.4, 0)	=TCROUND(6*A1+B1, 0)

The precise calculation for cell C1 is $6\times1.3+1.4=9.2$. Rounding cells A1 and B1 would result in $6\times1+2=8$ or $6\times2+1=13$. The actual result 9.2 cannot be rounded to 8 or 13, and the output from think-cell round looks like this:

	A	B	C
1	#NUM!	1	9

Note: The Excel function AVERAGE is interpreted by think-cell round as a combination of summation and constant multiplication. Also, a summation where the same addend appears more than once is mathematically equivalent to a constant multiplication, and the existence of a solution is not guaranteed.

General multiplication and other functions

As long as the TCROUND functions are used for all relevant cells and intermediate results are connected merely by +, -, SUM and AVERAGE, the addends as well as (intermediate) totals are integrated into a single rounding problem. In these cases, think-cell round will find a solution that provides consistency throughout all cells involved, if such a solution exists.

Since TCROUND is a normal Excel function, it can be combined with arbitrary functions and operators. But when you use functions other than the ones mentioned above to connect results from TCROUND statements, think-cell round cannot integrate the components into one interconnected problem. Instead, the components of the formula will be taken as distinct problems which will be solved independently. The results will then be used as input to other formulas.

In many cases, the output from think-cell round will still be reasonable. There are cases, however, where the use of operators other than +, -, SUM and AVERAGE leads to rounded results which are far off from the result of the non-rounded calculation. Consider the following example:

	A	B	C
1	=TCROUND(8.6, 0)	=TCROUND(1.7, 0)	=TCROUND(A1*B1, 0)

In this case, the precise calculation for cell C1 would be $8.6\times1.7=14.62$. Since cell A1 and cell B1 are connected by a multiplication, think-cell round cannot integrate the formulas from these cells into a common problem. Instead, after detecting cell A1 as valid input, cell

B1 is evaluated independently and the output is taken as a constant within the remaining problem. Since there are no further constraints, value 1.7 from cell B1 is rounded to the nearest integer, which is 2.

At this point, the "precise" calculation for cell C1 is 8.6×2=17.2. This is the problem that think-cell round now tries to solve. There is a consistent solution which requires rounding up 17.2 to 18. The result looks like this:

	A	B	C
1	9	2	18

Note that the rounded value in cell C1, which is 18, greatly differs from the original value 14.62.

Troubleshooting TCROUND formulas

There are two possible error results you may come across when using think-cell round: `#VALUE!` and `#NUM!`.

#VALUE!

The `#VALUE!` error hints to syntactical problems, such as mistyped formulas or bad parameters. For example, the second parameter for TCROUND must be an integer value. Also, pay attention to use correct delimiters. For example, while in international Excel the formula looks like this: `=TCROUND(1.7, 0)`, in a localized German version of Excel it must be written as: `=TCROUND(1,7; 0)`

Another mistake specific to think-cell round is the placement of the TCROUND function call: You cannot use a TCROUND function within another formula. Please make sure that TCROUND is the outermost function of the cell's formula. (see Placement of TCROUND functions on page 103)

#NUM!

The `#NUM!` error results from numerical problems. When the output of a TCROUND function is `#NUM!`, this means that the problem as stated by the given set of formulas is mathematically unsolvable. (see Limitations of think-cell round on page 103)

As long as the formulas enclosed by TCROUND functions contain merely +, - and SUM, and all TCROUND statements share the same precision (second parameter), a solution is guaranteed to exist and will be found by think-cell round. However, in the following cases there is no guarantee that a consistently rounded solution exists:

- Formulas involve other operations like multiplication or numerical functions. Also, summations where the same addend appears more than once are mathematically equivalent to a multiplication.
- You use different precisions in the second parameter of the TCROUND function.
- You make frequent use of the specific functions TCROUNDDOWN, TCROUNDUP and TCROUNDNEAR.

You can try to restate the problem to get a consistent solution. Try the following:

- Use a finer precision for some or all TCROUND statements.
- Do not use TCROUND with multiplication or numerical functions other than +, - and SUM.
- Use the same precision (second parameter) for all TCROUND statements.

– Use TCROUND instead of the more specific functions TCROUNDDOWN, TCROUNDUP and TCROUNDNEAR wherever possible.

Appendix

A. Deployment guide

This chapter describes how to deploy think-cell in a larger organization. If you want to install a personal copy of think-cell on your computer, please refer to Installation and update on page 11.

Workstation prerequisites

To install and run think-cell, the following software must be installed:

- Microsoft Windows Vista, 7, 8, 8.1 or 10
- Microsoft Office 2007 SP1, 2010, 2013 or 2016 with at least the following components:
  - Microsoft Office Excel
  - Microsoft Office PowerPoint
  - Visual Basic for Applications (from Office Shared Features)
  - Microsoft Graph (from Office Tools)

The installation of think-cell requires about 80 MB of disk space.

Initial installation

The think-cell installation files, *setup_*.msi* and *setup_*.exe*, understand the same parameters as Windows' `msiexec` command, though not all combinations are recommended and supported. Note that there is only one installer and think-cell will use 32-bit or 64-bit as needed. Use the *setup_*.exe* if users shall install think-cell by double-clicking the setup file.

Use the following approaches for scripted or command prompt installations, or if you need to force certain installation options:

Per-machine

```
setup_*.msi /qn TARGETDIR="<absolute path>"
```

- The executing account needs full administrator permissions, e.g., when using a script started by remote maintenance software, or when starting the installer from a command prompt which was launched with "Run as administrator". The installation will abort if the account has insufficient privileges.
- Omit the `ALLUSERS` parameter.

– The other parameters are optional:
  – The `/qn` parameter suppresses the Windows Installer user interface.
  – The default destination directory is

    `%PROGRAMFILES%\think-cell`

    on 32-bit Windows systems and

    `%PROGRAMFILES(X86)%\think-cell`

    on 64-bit Windows systems. If you set a different path with the `TARGETDIR` parameter make sure the destination is in the per-machine context.
– If you prefer you may also use the *setup_*.exe* as follows:

  `setup_*.exe ALLUSERS=1`

  The other parameters work the same as for the *setup_*.msi*.

Automatic privilege elevation by Windows User Access Control (UAC)

```
setup_*.exe /qb
```

– Omit the `ALLUSERS` parameter. You will get a per-machine installation if the user account can elevate to administration permissions, otherwise the installer falls back to per-user.
– The other parameters are optional:
  – With Windows Vista and 7, `/qn` may be used to completely suppress the installer's user interface. `/qb` displays a progress bar and `/qb!` removes its **Cancel** button. With Windows 8 and later versions only `/qb` is recommended as `/qn` may silently abort the installation or unexpectedly install per-user even though the account may elevate permissions. (This is due to Microsoft's changes to UAC in Windows 8 and depends on the account's specific UAC settings.)
  – For the default destination directory of per-machine installation see above. For per-user installation the default is

    `%LOCALAPPDATA%\think-cell`

    It is recommended not to set a different path with the `TARGETDIR` parameter, but if you do, make sure it has the appropriate permissions and ownership for the respective context.

Force per-user

```
setup_*.exe /qn ALLUSERS=""
```

– `ALLUSERS=""` forces a per-user installation even if the user account may elevate permissions by UAC.
– Execute the installer for each user account.
– The other parameters are optional:
  – `/qn` may be used to completely suppress the installer's user interface. `/qb` displays a progress bar and `/qb!` removes its **Cancel** button.
  – The default destination directory is

    `%LOCALAPPDATA%\think-cell`

    It is recommended not to set a different path with the `TARGETDIR` parameter, but if you do, make sure it has the appropriate permissions and ownership for the respective account.

Note: With the `LICENSEKEY=` parameter a license key can be specified during installation. However, see

Group Policies on page 112 for a better method of distributing the license key which will help with future key updates. See Ribbon in Office 2007 and later on page 113, Updates on page 114 and Online quality assurance on page 116 for details of additional options that may be specified on the installation command line.

Language

think-cell's user interface is available in English, French, German, Italian, Portuguese and Spanish, automatically detecting the user's language preference by using the same language as Windows and Office. All supported languages are included in the same, unified installation package. If a language is not yet supported by think-cell, English is used. It is not possible to alter this automatic language selection behaviour.

In the setup routine, think-cell uses the language corresponding to the Windows regional settings. After installation, think-cell uses the same language as in the menus and dialogs of the installation of Microsoft Office.

Installed files

The following files are required for think-cell and are created in the installation directory:

- *tcaddin.dll* (approx. 20 MB)
- *manual_de|en|es|fr|it|pt.pdf* (each approx. 2 MB)
- *custom.xml* (< 200 KB)
- *sla.rtf* (approx. 100 KB)
- *splash.bmp* (approx. 100 KB)
- *d3dx9_43.dll* (approx. 2 MB)
- *dbghelp.dll* (approx. 2 MB)
- *tcdiag.exe* (< 1 MB)
- *tcdotnet.dll* (approx. 8 KB)
- *tcmail.exe* (< 600 KB)
- *tcrunxl.exe* (< 500 KB)
- *admin-policy-templates/think-cell.adm* (approx. 10 KB)
- *admin-policy-templates/think-cell.admx* (approx. 10 KB)
- *admin-policy-templates/en-US/think-cell.adml* (approx. 10 KB)
- *styles/example_style_complex.xml* (< 10 KB)
- *styles/example_style_default.xml* (< 10 KB)
- *styles/example_style_simple.xml* (< 10 KB)
- *styles/no_style.xml* (< 10 KB)
- *xml-schemas/dml-chart.xsd* (< 100 KB)
- *xml-schemas/dml-chartDrawing.xsd* (< 10 KB)
- *xml-schemas/dml-diagram.xsd* (< 100 KB)
- *xml-schemas/dml-lockedCanvas.xsd* (< 10 KB)
- *xml-schemas/dml-main.xsd* (< 200 KB)
- *xml-schemas/dml-picture.xsd* (< 10 KB)
- *xml-schemas/shared-commonSimpleTypes.xsd* (< 10 KB)
- *xml-schemas/shared-relationshipReference.xsd* (< 10 KB)
- *xml-schemas/tcstyle.xsd* (< 20 KB)

On 64-bit versions of Windows Vista, 7, 8, 8.1 and 10 the following additional files are required for think-cell and are created in the installation directory:

- *x64/tcaddin.dll* (< 25 MB)
- *x64/tcdiag.exe* (< 1 MB)
- *x64/tcrunxl.dll* (< 1 MB)
- *x64/d3dx9_43.dll* (approx. 5 MB)
- *x64/dbghelp.dll* (approx. 2 MB)

The think-cell installation does not write to folders other than the chosen installation folder.

While using think-cell additional files are written to the following folders:

```
C:\Documents and Settings\[user]\ ↦
Application Data\think-cell
```

```
C:\Documents and Settings\[user]\ ↦
Local Settings\Application Data\think-cell
```

Windows Vista, 7, 8, 8.1 and 10:

```
C:\Users\[user]\AppData\Roaming\think-cell
```

```
C:\Users\[user]\AppData\Local\think-cell
```

Registry entries

To interact with Microsoft PowerPoint and Microsoft Excel, the installation of think-cell creates some new keys in the following sections of the Windows registry. Depending on whether you have a regular installation or a single-user-installation, the keys are created in the `HKEY_LOCAL_MACHINE` or in the `HKEY_CURRENT_USER` section:

```
\Software\Classes\CLSID\ ↦
{3EAB3858-A0E0-4A3B-A405-F4D525E85265}
```

```
\Software\Classes\CLSID\ ↦
{D52B1FA2-1EF8-4035-9DA6-8AD0F40267A1}
```

```
\Software\Classes\thinkcell.addin
```

```
\Software\Classes\thinkcell.addin.1
```

```
\Software\Classes\TCLayout.ActiveDocument
```

```
\Software\Classes\TCLayout.ActiveDocument.1
```

```
\Software\Microsoft\Office\ ↦
PowerPoint\Addins\thinkcell.addin
```

```
\Software\Microsoft\Office\ ↦
Excel\Addins\thinkcell.addin
```

In 64-bit versions of Windows the following additional keys are created:

```
\Software\Classes\Wow6432Node\CLSID\ ↦
{3EAB3858-A0E0-4A3B-A405-F4D525E85265}
```

```
\Software\Classes\Wow6432Node\CLSID\ ↦
{D52B1FA2-1EF8-4035-9DA6-8AD0F40267A1}
```

```
\Software\Wow6432Node\Microsoft\Office\ ↦
PowerPoint\Addins\thinkcell.addin
```

```
\Software\Wow6432Node\Microsoft\Office\ ↦
Excel\Addins\thinkcell.addin
```

The license key and the settings for online quality assurance and automatic updates are saved in the following section of the Windows registry:

```
Software\Classes\Software\think-cell
```

If group policies based on *think-cell.adm/x* (see Group Policies on the next page) are used in your network, think-cell may also use:

```
HKEY_LOCAL_MACHINE\Software\Policies\ ↦
think-cell
```

```
HKEY_CURRENT_USER\Software\Policies\ ⟶
think-cell
```

think-cell changes no other sections of the Windows registry.

Group Policies

think-cell supports Windows' group policies to centrally control think-cell's behavior for a group of users or on a group of machines. To use group policies, you need to create a group policy object and link it to a site, domain or organizational unit using the *Group Policy Management Console*.

The following explanation requires an understanding and working knowledge of group policy concepts and administration. For general information on Windows group policy concepts and details of their usage and update mechanisms refer to the contents of the online help of the *Group Policy Management Console*.

think-cell's specific configuration options are described in the *think-cell.adm* and *think-cell.admx* administrative template files, which are located in think-cell's installation directory in the subdirectory *admin-policy-templates*. To make use of the new options, depending on the file type:

- for *think-cell.adm*: In the *Group Policy Object Editor* use **Add/Remove Templates**... under **Action**
- for *think-cell.admx*: Copy *think-cell.admx* and *en-US* *think-cell.adml* from *admin-policy-templates* to *%SYSTEMROOT%* *PolicyDefinitions* and *%SYSTEMROOT%* *PolicyDefinitions* *en-US* respectively

A new node **think-cell** is added to the node **Administrative Templates** in the following two places: the think-cell settings configured under **Computer Configuration** determine registry entries at

```
HKEY_LOCAL_MACHINE\SOFTWARE\Policies\ ⟶
think-cell
```

and the think-cell settings configured under **User Configuration** determine registry entries at

```
HKEY_CURRENT_USER\SOFTWARE\Policies\ ⟶
think-cell
```

If settings are enabled at both places, those under **Computer Configuration** take precedence.

The items of the node **think-cell** show the available settings that can be controlled with group policies. Each item has a description with the available values for this item.

You can use group policies to activate or deactivate think-cell for a group of individual users. For instance, if you deploy think-cell on a terminal server you need to make sure that only the licensed users have access to think-cell. When used in the following way, group policies offer a convenient method to do so:

1. Set up one group policy object which disables think-cell completely and link it to your domain. Use the **Product Access Control** setting of the administrative template **think-cell** with the appropriate value.
2. Add another group policy object which activates the software for the licensed users. This should also be linked to your domain and be applied after the disabling one. Because group policy objects are applied in reverse order the enabling object should be further up in the list in *Group Policy Management Console*.

3. In the section **Security Filtering** of the *Group Policy Management Console* restrict access to the enabling group policy object explicitly to the licensed users of think-cell.

Another convenient use for group policies is the centralized management and distribution of the think-cell license key to the think-cell users in your organization. The license key is one of the settings of the administrative template **think-cell**.

Ribbon in Office 2007 and later

The think-cell toolbar in Office 2007 and later is implemented as a ribbon group. The default position for the think-cell group in PowerPoint is in the Insert tab (`TabInsert`), after the Insert Illustrations group (`GroupInsertIllustrations`); the default position in Excel is after the Insert Excel Charts group (`GroupInsertChartsExcel`) in the Insert tab.

Detailed information about customizing the Office ribbon is available from:

https://www.think-cell.com/ribbon

The following properties may be specified during installation to customize the think-cell group within PowerPoint:

`RIBBONPPTABINSERT` Specify XML attributes for the `tab` element containing the think-cell group.

`RIBBONPPGROUPINSERT` Specify XML attributes for the think-cell `group` element.

`RIBBONPPXMLNS` Specify additional XML namespace attributes for the `customUI` element.

Note: All of these parameters apply to the setup.msi as well as the setup.exe.

If no `id`, `idMso` or `idQ` attribute is specified using the `RIBBONPPTABINSERT` property then the think-cell group will be placed in the Insert tab. Similarly, if no `id` or `idQ` attribute is specified using the `RIBBONPPGROUPINSERT` property then a unique local id for the think-cell group will be automatically generated. Additionally, if no label is specified using the `RIBBONPPGROUPINSERT` property then the label `think-cell` will be used.

Adding the following option to the setup command line, for example, will place the think-cell group in a new, user-defined tab, positioned after the built-in Home tab:

```
RIBBONPPTABINSERT="id=""TabNew"" label=
""My New Tab"" insertAfterMso=""TabHome"""
```

Note: Any quote characters in the XML snippets must be double-quoted when specifying the properties on the setup command line.

Alternatively, adding the following options to the setup command line will place the think-cell group in the built-in Home tab after the Font group and label the group:

```
RIBBONPPTABINSERT="idMso=""TabHome"""
RIBBONPPGROUPINSERT="insertAfterMso=
""GroupFont"" label=""think-cell"""
```

The `idQ` attribute can be used to specify qualified identifiers for both the think-cell group and tab. Any namespaces required for the qualified identifiers can be specified using the `RIBBONPPXMLNS` property.

For example, adding the following two options to the setup command line will place the think-cell group in a user-defined tab `TabUser`, qualified using the namespace `http://example.com/ribbon`, and positioned before the Insert tab:

```
RIBBONPPXMLNS="xmlns:ribbon=
""http://example.com/ribbon"""

RIBBONPPTABINSERT="idQ=""ribbon:TabUser""
label=""My User Tab""
insertBeforeMso=""TabInsert"""
```

Qualified identifiers can be useful when several add-ins or templates wish to customize the PowerPoint ribbon. If several add-ins, for example, specify a tab using the same qualified identifier then a single user-defined tab will be created and each of the add-ins can position groups within this common user-defined tab. Specifying a qualified identifier for the think-cell group lets other add-ins or templates position groups relative to the group. Similarly, the think-cell group can use qualified identifiers to position itself relative to the groups of other add-ins or templates. For example, the following options specify a qualified identifier for the think-cell group and positions it relative to a user-defined group:

```
RIBBONPPXMLNS="xmlns:ribbon=
""http://example.com/ribbon""
xmlns:special=
""http://example.com/special"""

RIBBONPPGROUPINSERT="
idQ=""ribbon:GroupThinkCell""
insertAfterQ=""special:GroupSpecial"""
```

It is important to note that the order in which add-ins or templates are loaded may influence the customization of the PowerPoint ribbon. If, in the example above, the add-in that creates the `special:GroupSpecial` group is loaded after the think-cell add-in then positioning relative to the `special:GroupSpecial` will have no effect. The order of loading cannot always be controlled and it is recommended that pairs of user-defined groups requiring relative positioning should both position themselves relative to the other. This should ensure that whichever group is loaded last will position itself correctly relative to the other. In the above example, the XML code for the `special:GroupSpecial` group should contain an `insertBeforeQ` attribute that references the think-cell group's qualified identifier.

The think-cell group in Excel can be similarly customized using the `RIBBONXLTABINSERT`, `RIBBONXLGROUPINSERT` and `RIBBONXLXMLNS` properties.

Updates

think-cell has built-in automatic update support. If automatic updates are enabled and PowerPoint is started, the software checks whether a new version is available. The user then has the option to either accept or delay the update. If you would prefer to have this function deactivated please contact us.

If available, think-cell uses the *Microsoft Background Intelligent Transfer Service* (BITS) to download updates. BITS automatically frees bandwidth when the user needs it, and hence does not interfere with dial-up connections. It also recovers gracefully from network interruptions common in mobile computing environments.

Before any downloaded code is executed, the signature is checked for validity (see Automatic update on page 12 for a security note with more details). Each update is approximately 30 MB in size.

Updates are usually hosted on think-cell's web server, but you have the option to host updates within your own intranet. To do so, you need a web server such as Apache or Microsoft Internet Information Server (IIS) that all think-cell users within your organization can access.

The following files must be placed on the web server hosting your updates:

– An XML text file, typically called *update.xml*, that controls the update process. See below for a description of the update XML file format.
– One or more *setup_<version>.exe* update files, supplied by think-cell.

After placing the necessary files on the web server, think-cell must be installed with the `UPDATESURL` command line option specifying the location of the update XML file (see Initial installation on page 108), e.g.

```
UPDATESURL="http://example.com/update.xml"
```

The update XML file must contain a list of scenarios, with each scenario consisting of a set of conditions and the corresponding URL of a setup file. The first scenario whose conditions are met determines the file that the computer will download and install. By applying conditions such as a list of machine or user names, different users can receive different updates. For example, new program versions can first be distributed to a small group of pilot users before they are rolled out in the whole organization.

Figure A.1 on page 118 shows a typical example of an update XML file. Conditions within the file are written in the *Windows Management Instrumentation Query Language* (WQL), which gives access to all relevant system parameters. To learn more about WQL, go to:

`https://www.think-cell.com/wql`

Notification about license key expiration

think-cell requires a license key and can be used up to and on the expiration date of the license key.

The software will notify the user about the upcoming expiration on every start of PowerPoint and Excel if the expiration date is less than 14 days away. If the license key is expiring on the 15th, 30th, 31st of a month a notification is shown for the first time on the 2nd, 17th, 18th of the same month.

The license key dialog is used to notify the user. If the license key has not yet expired, the message "The license key of this think-cell product will expire soon. You should enter a new license key:" is shown together with the expiration date. The user has the following choices:

– Enter a new license key and click **OK**.
– Click **Cancel** to dismiss the dialog.
– Click **Uninstall** to uninstall think-cell.

If the expiration date has already passed, the message "The license key of this think-cell product has expired. Please enter a new license key:" is shown, but clicking **OK** is only possible after a valid license key has been entered. If the dialog is dismissed using **Cancel** think-cell remains deactivated.

To prevent the license expiration dialog from being shown please make sure to order and deploy a new license key more than 14 days before the expiration date. A new license key is always valid immediately and not only after the expiration date of the old license key. Therefore you should deploy the new license key as soon as it is available.

Online quality assurance

At think-cell, we are committed to stability and robustness as key factors for the professional use of our software. When an error condition arises while you are using think-cell, the software automatically generates a report that helps us to understand the problem and fix it in the next release.

An automatically created report contains the following information:

- date and time,
- your customization id (a three or four digit number (530 for the public version) that is the same for all users within a corporate unit; can also be found in the **About** dialog),
- the program build (a five-digit number; can also be found in the **About** dialog),
- an error code from the operating system or from PowerPoint or Excel,
- the location in our source code (file name and line number) where the error occurred,
- a Microsoft *Minidump*, which is basically a stack trace along with environment information such as operating system version and loaded modules. Microsoft uses the same Minidump when they send error reports,
- if desired, the machine name or its serial number, allowing your IT personnel to identify the concerning machine or user. We may get valuable additional information if we can talk to the user who experienced the problem.
- or, alternatively, an anonymous *Globally Unique Identifier* (GUID), which is used to correlate multiple error reports. The GUID is created when using think-cell for the first time and stored together with the user's settings. It is a random string with no connection to the machine, user or document current at the time of creation. Using the GUID, it is only possible to determine whether two error reports came from the same or from different users.

The error report is sent via HTTPS to the think-cell server. Of all the information transmitted, only the Minidump, essentially memory content, could potentially contain actual slide content fragments. But in its operation, think-cell never stores actual slide content. Storing text or images is completely left to PowerPoint. Therefore it is very unlikely that the Minidump of the memory used by think-cell contains any sensitive information.

You can test the error reporting mechanism by typing `errorreporttest` into any textbox within PowerPoint. A message box confirms that an error report has been sent.

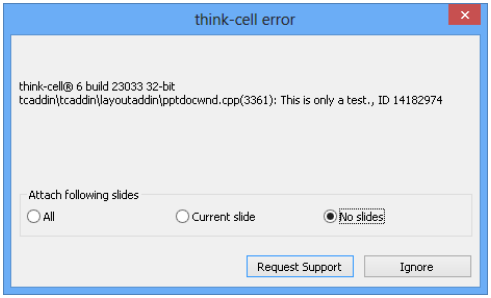
Automatic error reporting can be enabled or disabled by appending one of the following `REPORTS` options to the installation command line (see Initial installation on page 108):

`REPORTS=0` Disable automatic error reporting.

`REPORTS=1` Enable automatic error reporting.

Trouble shooting and critical errors

In case of critical errors the user is asked whether he or she would like to file a support request.



These support requests can also be sent manually (Trouble shooting on page 12). It is possible to change the default e-mail address for support requests. Append the following parameter to the installation command line (see Initial installation on page 108):

```
SUPPORTEMAIL="supportdesk@yourcompany.com"
```

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<root>
  <CUpdateInfo id="1">
    <m_vecupdscen length="2"><!-- list of 2 different update scenarios -->
      <!-- First scenario: the group of pilot users. -->
      <!-- This scenario is evaluated first, and if it is executed, the
           second scenario is skipped. -->
      <elem>
        <!-- Update file of this scenario : The pilot group receives
             think-cell build 17950 -->
        <m_bstrFile>http://example.com/setup_17950.exe</m_bstrFile>
        <!-- List of 2 conditions that must _all_ be met to install the file -->
        <m_vecupdcond length="2">
          <elem>
            <!-- WQL query that an earlier build of think-cell is
                 installed. The query searches the local WQL database
                 (not the network). Thus it will either return one product
                 record, if an older product is installed, or none otherwise. -->
            <m_bstrQuery>select * from Win32_Product where Name='think-cell' and
              Version&lt;'1.17.950.0'</m_bstrQuery>
            <!-- The number of returned records is now numerically compared:
                 -2 stands for less than, -1 for less or equal; 0 for equal;
                 1 for greater or equal; 2 for greater than -->
            <m_eupdcondop val="0"/>
            <!-- Compare to numerical value 1 -->
            <m_nCount val="1"/>
          </elem>
          <elem>
            <!-- WQL query that the computer system is named ANNA, TOM
                 or FRANK (the group of pilot users). Again, the query
                 is executed locally, returning either one computer
                 system (the one the query is running on) or none. -->
            <m_bstrQuery>select * from Win32_ComputerSystem where Name='ANNA' or
              Name='TOM' or Name='FRANK'</m_bstrQuery>
            <!-- number of returned records equal to 1 -->
            <m_eupdcondop val="0"/>
            <m_nCount val="1"/>
          </elem>
        </m_vecupdcond>
      </elem>
      <elem><!-- Second scenario: all other users. -->
        <!-- All other users receive think-cell build 17883. -->
        <m_bstrFile>http://example.com/setup_17883.exe</m_bstrFile>
        <!-- List of 1 condition that must be met to install the file -->
        <m_vecupdcond length="1">
          <elem>
            <m_bstrQuery>select * from Win32_Product where Name='think-cell' and
              Version&lt;'1.17.883.0'</m_bstrQuery>
            <!-- number of returned records equal to 1 -->
            <m_eupdcondop val="0"/>
            <m_nCount val="1"/>
          </elem>
        </m_vecupdcond>
      </elem>
    </m_vecupdscen>
  </CUpdateInfo>
</root>
```

Figure A.1 Example of an `update.xml` file

B. Exchanging files with PowerPoint

This chapter covers some issues that arise when your coworkers use PowerPoint without think-cell installed.

Loading files from think-cell in PowerPoint

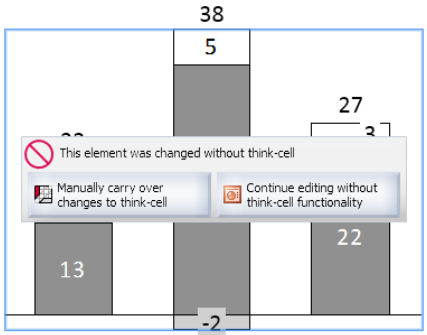
Any files created by PowerPoint with think-cell installed are 100% compatible with PowerPoint. This means that coworkers and customers who do not have think-cell installed can open and edit the files without noticing any difference. The think-cell elements appear as regular PowerPoint shapes such as textboxes and Microsoft Graph objects.

Reimporting think-cell elements from PowerPoint

Consider the following scenario:

1. A presentation has been created using PowerPoint with think-cell installed, and contains think-cell elements.
2. The same presentation has been edited in PowerPoint without think-cell, and some of the shapes that are part of a think-cell element have been altered.
3. Now, you want to use think-cell again to further modify the elements.

In this scenario, when you attempt to select a think-cell element that has been altered without think-cell, the software will recognize the element as inconsistent and display the following message box:



In order to proceed, you will need to decide whether to continue using the PowerPoint edited version without think-cell functionality or to reimport the element to think-cell.

You should carefully consider the following consequences before making your decision:

– **Manually carry over changes to think-cell** reimports the element to think-cell and restores the intelligent think-cell element functionality, but discards all changes made without think-cell. If you wish to preserve any of the changes then they must be manually re-applied to the think-cell element.

– **Continue editing without think-cell functionality** continues to use the PowerPoint edited version and ensures that all changes are preserved. The intelligent think-cell element functionality, however, is lost and standard PowerPoint tools must be used to further edit these shapes and objects.

If you decide to use **Manually carry over changes to think-cell**, then the following toolbar is displayed, letting you compare slides containing the alternative versions of the think-cell element:

The toolbar lets you quickly and easily view the slides containing the PowerPoint and think-cell versions of the element.

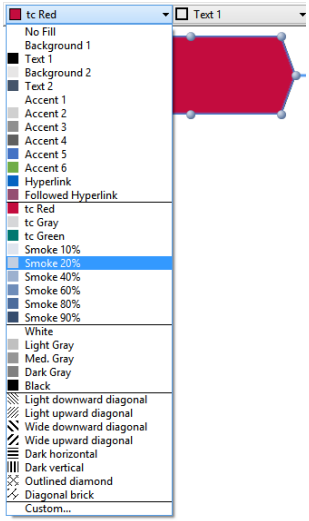
You may want to compare the think-cell element with the PowerPoint version and compare and copy, for example, data values to reflect any changes that you wish to preserve in the think-cell version.

Having made any necessary changes, click the **Finish** button to remove the PowerPoint version from the presentation and end the reimport process.

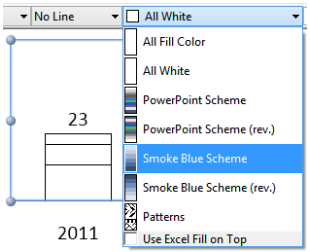
C. Customizing think-cell

This chapter describes how to customize think-cell, i.e., how to change default colors and other default properties.

The following properties can be changed using style files: The list of available colors and patterns (see Color and fill on page 19)



The list of available color schemes (see Color scheme on page 20)



The colors of Harvey ball and checkbox (see Checkbox and Harvey ball on page 79)

The list of available lines styles for the line chart and all connectors. The list of available markers for line charts and scatter charts

The first sections describe creating and loading a style file and explain how to deploy it in an organization. An understanding of these tasks is required in any case. Afterwards, you may either follow the Style file tutorial on page 123 to create your own style file or go through the format reference in Style file format on page 126.

Creating a think-cell style

Simple modifications to an existing style file can be made using any text editor. A new think-cell style file should be created using a dedicated XML editor. It will support you by automatically checking for errors and making suggestions on how to solve them. We recommend Microsoft Visual Studio for this purpose. It seems to be a heavy package for such a simple task, but as it turns out, the task is not so simple after all and Visual Studio offers the best XML editing experience we have seen to date. If you already have Visual Studio installed, any version will do. If you do not yet have Visual Studio installed, simply choose the lightest available package, which is **Visual Studio Express for Web**:

`http://www.microsoft.com/visualstudio/downloads`

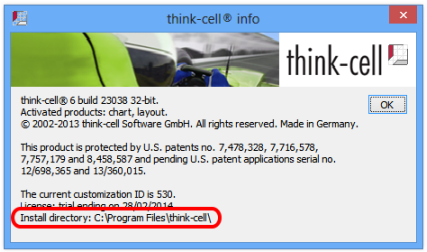
There, go to the section **Community & Express** and locate the most recent release that ends with "for Web", e.g., "Express 2013 with Update 4 for Web" or a newer version.

With Visual Studio installed, you can open the XML style file and Visual Studio can retrieve the associated syntax definition ("XML Schema") from our webserver automatically and in the background, you do not have to care or even know about it. To enable this behavior:

- In the menu, go to **Tools**, **Options**.
- On the left, go to the **Text Editor** category.
- Choose the **Miscellaneous XML Options** page.
- Enable **Automatically download DTDs and schemas**.

It will then highlight errors in your document, and with Ctrl-Spacebar you can trigger *auto completion*: Visual Studio will offer a choice of tags, attributes or values applicable to the current context (position of the text cursor). If you move the mouse over highlighted errors, you will get a tooltip with a detailed explanation of the error. The same information is also available in the **Error List** window (regardless of where your mouse pointer is). To show it, go to **View** > **Error List**.

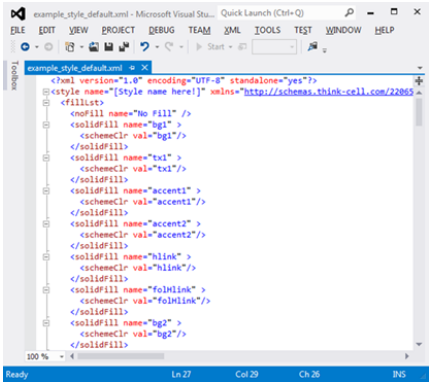
Several sample style files are delivered together with think-cell and you can find them in the subfolder *styles* in the think-cell installation folder. First, find out the location of the installation folder. It is shown when you click **About** in the **More** menu.


think-cell® info
think-cell
think-cell® 6 build 23038 32-bit.
Activated products: chart, layout.
© 2002-2013 think-cell Software GmbH. All rights reserved. Made in Germany.
OK
This product is protected by U.S. patents no. 7,478,328, 7,716,578, 7,757,179 and 8,458,587 and pending U.S. patent applications serial no. 12/698,365 and 13/360,015.
The current customization ID is 530.
Install directory: C:\Program Files\think-cell\

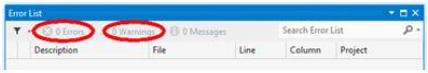
Open this folder and go to the subfolder *styles*, e.g.,

```
C:\Program Files\think-cell\styles
```

Open the file *example_style_default.xml*. It should look like this:



The editor automatically checks your file for errors. You can display an error list by clicking on **View > Error List**:



Make sure that there are no warnings or errors indicated before you save an edited style file.

Of course, any other editor that supports XML also works. The file needs to be saved with an `.xml` extension.

Loading style files

To load a style file, choose **Load Style File**... from the menu **More**. In the dialog, navigate to the folder with the style file, choose the file and click **Open**. It is used for any new charts in the current presentation.

For example, after you load the sample style file *example_style_complex.xml* from the *styles* directory in think-cell's installation path, the color and color scheme property controls will include customized items.

If you want to apply a style's colors or color schemes in existing charts, you need to do so manually.

Deploying think-cell styles

Load Style File... loads a style file into the master slide of the current presentation. When the presentation is distributed as a PowerPoint template, the think-cell style is implicitly distributed as well. It should not be necessary to give a think-cell style file to individual users. Switching between styles is accomplished by switching between PowerPoint templates.

Style file tutorial

In think-cell's installation directory (usually `C:\Program Files\think-cell`), in the subdirectory `styles`, you can find the style file `example_style_default.xml`. This style mirrors the colors and color schemes that are available immediately after installation when no style is loaded. Therefore:

1. Make a copy of `example_style_default.xml` and load it into an XML editor (see Creating a think-cell style on the previous page for choosing a suitable editor).

2. Walk through the file from top to bottom making the changes described in the following steps.
3. Remove any unneeded colors from the list inside the `fillLst` element. You will find `solidFill`, `pattFill` and `separator` elements corresponding to the items in the color list displayed in think-cell (see Color and fill on page 19). To remove, e.g., a `solidFill` element, remove everything between and including the opening tag `<solidFill ...>` and the closing tag `</solidFill>`.
4. Optionally, create a new section for your own colors. To do this, insert a `separator` tag by writing `<separator/>` at the appropriate location in the color list. Also, feel free to use line breaks, indentation and empty lines to structure the XML code in the style file for your own convenience. Spaces and linebreaks have no effect on the resulting style.
5. Add your own colors using the `solidFill` element. Your color needs a name and values for the red, green and blue channels. You should have these values from the specification document for your company's corporate identity. If the color's name should be "Light Green", the decimal value for the red channel `170`, for green `255` and for blue `42`, then it should look like this:

```
<solidFill name="Light Green">
  <sdrgbClr r="170" g="255" b="42"/>
</solidFill>
```

6. Remove any unneeded color schemes from the list inside the `fillSchemeLst` element. You will find `fillScheme` elements corresponding to the items in the color scheme list displayed in think-cell (see Color scheme on page 20). To remove a `fillScheme` element, remove everything between and including the opening tag `<fillScheme ...>` and the closing tag `</fillScheme>`.
7. Optionally, modify an existing color scheme. You can
   - remove one or multiple colors from the scheme by removing the respective `fillRef` elements or
   - reorder the existing colors by reordering `fillRef` elements or
   - include one of your own colors by adding a `fillRef` element inside the `fillScheme` element at the appropriate place. If you wish to include the color defined above, add the following line:

     ```
     <fillRef name="Light Green"/>
     ```

   Note that you can only use colors that have been defined in the `fillLst` section (see steps 3.-5.) above. In particular, if you removed any colors in step 3., you must remove those colors from the color schemes, too.
8. Optionally, create a new color scheme using the `fillScheme` element. Your scheme needs a name, e.g., "Green Scheme", and a list of color references as `fillRef` elements. If you had defined the colors "Dark Green" and "Medium Green" in addition to "Light Green" above, your color scheme might look like this:

```
<fillScheme name="Green Scheme">
  <fillRef name="Dark Green"/>
  <fillRef name="Medium Green"/>
  <fillRef name="Light Green"/>
</fillScheme>
```

9. Check the contents of the `fillSchemeRefDefault` element. The `name` attribute specifies the color scheme that is used by default when inserting new charts. If

you wish to set your own color scheme as the new default, modify the code like this:

```
<fillSchemeRefDefault name="Green scheme"/>
```

10. Save the modified style file, load it (see Loading style files on page 123) and test it.

11. Deploy the new style in your organization as described in Loading style files on page 123. In particular, it is not necessary to send the XML file to your colleagues, but you should of course keep it for your own reference.

D. Style file format

think-cell style files are XML files conforming to the schema

`http://schemas.think-cell.com/24132/tcstyle.xsd`

style

The `style` element is the root element of a style file. The mandatory attribute `name` sets the name that is shown in the **More** menu as the currently active style. The attributes `xmlns`, `xmlns:xsi` and `xsi:schemaLocation` should not be changed from the example when creating a new style file.

When changing an existing style file, please update the build number in the attributes `xmlns` and `xsi:schemaLocation` to the one shown in the following example.

Example:

```
<style name="Example style name"
xmlns="http://schemas.think-cell.com/24132/style"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://schemas.think-cell.com/24132/style
http://schemas.think-cell.com/24132/style.xsd">
...
</style>
```

noStyle

If a style file only contains this element, loading it will remove the current style information from the master slide.

Example:

```
<noStyle
xmlns="http://schemas.think-cell.com/24132/style"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://schemas.think-cell.com/24132/style
http://schemas.think-cell.com/24132/style.xsd"/>
```

Defining colors, line styles and markers

Colors

schemeClr. A fill based on one of PowerPoint's built-in scheme colors. The attribute `val` specifies the color using the values `bg1`, `tx1`, `accent1`, `accent2`, `accent3`, `accent4`, `accent5`, `accent6`, `dk1`, `lt1`, `dk2`, `lt2`, `hlink`, `folHlink`, `bg2` or `tx2`. When using `schemeClr`, the `name` attribute of the parent `solidFill` element will typically be set to the same value as the `val` attribute. Then, think-cell will use the name that appears in PowerPoint's scheme colors dialog,

depending on the version of PowerPoint and the user interface language.

Example:

```
<solidFill name="accent2">
  <schemeClr val="accent2"/>
</solidFill>
```

srgbClr. A fill based on a color defined using values for the red, green and blue components. The attribute `val` contains six hexadecimal characters for the three components.

Example:

```
<srgbClr val="FF00FF"/>
```

sdrgbClr. A fill based on a color defined using values for the red, green and blue components. The attributes `r`, `g` and `b` each contain numbers between 0 and 255.

Example:

```
<sdrgbClr r="0" g="255" b="0"/>
```

scrgbClr. A fill based on a color defined using values for the red, green and blue components. The attributes `r`, `g` and `b` each contain percentage values between 0% and 100%. The percentage values may use integers or decimal numbers with 2 decimal places and a dot as the separator.

Example:

```
<sdrgbClr r="0%" g="100%" b="66.66%"/>
```

prstClr. A fill based on the preset colors defined in the Office Open XML standard. The attribute `val` specifies the color name and must be one of the names from AliceBlue to YellowGreen enumerated in

```
msdn.microsoft.com/en-us/library/
documentformat.openxml.drawing.presetcolorvalues.aspx
```

or in subsection 20.1.10.47 of the Office Open XML standard.

Example:

```
<prstClr val="white"/>
```

Fills

solidFill. A fill based on a single color. The color can be specified using either one of the child elements `schemeClr`, `srgbClr`, or `prstClr`. The attribute `name` contains the name shown in the color list.

Example:

```
<solidFill name="White">
  <srgbClr val="FFFFFF"/>
</solidFill>
```

pattFill. A patterned fill based on a pattern and two colors. The colors can be specified using the child elements `fgClr` and `bgClr` describing the foreground and background color of the pattern respectively. The pattern itself can be specified declaring the attribute `prst` and referencing a pattern described in Office Open XML. The attribute `name` contains the name shown in the color list.

Example:

```
<pattFill name="Outlined diamond" prst="openDmnd">
  <fgClr>
    <prstClr val="black"/>
  </fgClr>
  <bgClr>
    <prstClr val="white"/>
  </bgClr>
</pattFill>
```

fgClr. Describes the foreground color of a pattern fill. The color can be specified using either one of the child elements `schemeClr`, `srgbClr`, or `prstClr`.

Example:

```
<fgClr>
  <prstClr val="black"/>
</fgClr>
```

bgClr. Describes the background color of a pattern fill. See `fgClr`.

Choices in the fill color control

fillLst. A list of fills, described by multiple instances of the elements `noFill`, `solidFill`, or `pattFill`. The fills defined in this list are shown in the color control of the floating toolbar (see Color and fill on page 19).

Example:

```
<fillLst>
  <solidFill ...
</fillLst>
```

noFill. When the user chooses this special fill from the color control, e.g., for a segment, the segment has no fill color. The attribute `name` contains the default name used in the color control, which cannot be changed.

```
<noFill name="No Fill"/>
```

separator. A horizontal line in the color, fill, line, or marker list shown in the floating toolbar.

Example:

```
<separator/>
```

Lines

ln. A line with certain weight based on a line type. Line styles are used in line charts (see Line chart on page 39) as well as for Universal connectors (see Universal connectors on page 52) and waterfall connectors (see Waterfall chart on page 54). The attribute `w` describes the weight of the line. The value for this attribute is noted in EMU (English Metric Unit). 12700 EMU are equivalent to a line weight of 1 pt. The attribute `name` contains a name used to reference this line style. The line type can be specified using the child element `prstDash`.

Example:

```
<ln name="Solid 0.25 pt" w="3175">
  <prstDash val="solid"/>
</ln>
```

prstDash. A line style based on the pre-set line styles defined in the Office Open XML standard. The attribute `val` specifies the line type using the values `solid`, `dot`, `dash`, `lgDash`, `dashDot`, `lgDashDot`, `lgDashDotDot`, `sysDash`, `sysDot`, `sysDashDot`, `sysDashDotDot`, which correspond to the Office Open XML standard:

msdn.microsoft.com/en-us/library/
documentformat.openxml.drawing.presetlinedashvalues.aspx

Example:

```
<prstDash val="solid"/>
```

Choices in the line style control

lnLst. A list of lines described by one optional instance of the element `noLine` and at least one instances of the element `ln`. The lines defined in this list are shown in the line style control of the floating toolbar (see Line style on page 21).

Example:

```
<lnLst>
  <ln ...
</lnLst>
```

To describe each entry in the list, the `w` attribute of the `ln` element is converted to points, e.g., 3175 EMU to 1/4pt, and displayed together with a visual representation of the dash type.

noLine. When the user chooses this special line style from the line style control, the line has no fill color. The attribute `name` contains the name used in the line style control. This element may appear only once within the list of lines.

Example:

```
<noLine name="No Line"/>
```

Markers

marker. A marker with a certain shape. The attribute `name` contains the name shown in the marker style list. The marker shape can be specified using the child element `symbol`.

Example:

```
<marker name="Marker Circle">
  <symbol val="circle"/>
</marker>
```

symbol. A marker shape based on the preset marker shapes defined in the Office Open XML standard. The attribute `val` specifies the marker type using the values `circle`, `triangle`, `diamond`, `square`, `star`, `x`, `hollowCircle`, `hollowTriangle`, `hollowDiamond`, `hollowSquare`, `dash`, `dot`, `plus`.

msdn.microsoft.com/en-us/library/
documentformat.openxml.drawing.charts.markerstylevalues.aspx

Example:

```
<symbol val="circle"/>
```

Choices in the marker control

markerLst. A list of markers described by one optional instance of the element `noMarker` and at least one instance of the element `marker`. The markers defined in this list are shown in the marker control of the floating toolbar (see Marker shape on page 21).

Example:

```
<markerLst>
  <marker ...
</markerLst>
```

noMarker. When the user chooses this special marker style from the marker style control, the marker has no fill color. The attribute `name` contains the default name used in the marker style control, which cannot be changed.

```
<noMarker name="No Marker"/>
```

Using colors, lines and markers in schemes

Choices in the color scheme control

fillSchemeLst. A list of think-cell color schemes that will be used in the color scheme control of the floating toolbar (see Color scheme on page 20). Individual fill schemes are defined using the `fillScheme` child element.

Example:

```
<fillSchemeLst>
  <fillScheme name="Company fill scheme">
  ...
</fillSchemeLst>
```

fillScheme. A color scheme consisting of a sequence of fills. It is defined by referencing fills using the child element `fillRef`. The attribute `name` contains the name that is used in the color scheme control.

If the optional boolean attribute `reverse` is set to `1`, the list of fills will be applied in reverse order, starting with the first fill for the bottom-most series, the second fill for the series above, and so on.

Example:

```
<fillScheme name="Company fill scheme" reverse="0">
  <fillRef name="White"/>
  ...
</fillScheme>
```

fillRef. A reference to a fill defined in the `fillLst` element. The attribute `name` must match the value of the same attribute in the fill definition.

Example:

```
<fillRef name="White"/>
```

Choices in the line scheme control

lnfillmarkerSchemeLst. A list of think-cell line schemes that will be used in the line scheme control of the floating toolbar. Individual line schemes are defined using the `lnfillmarkerScheme` child element.

Example:

```
<lnfillmarkerSchemeLst>
  <lnfillmarkerScheme name="Company line scheme">
  ...
</lnfillmarkerSchemeLst>
```

lnfillmarkerScheme. A line scheme consisting of a sequence of combined line styles. It is defined by describing line styles using the child element `lnfillmarker`, which references a line, a color, and a marker. The attribute `name` contains the name that is used in the line scheme control.

Example:

```
<lnfillmarkerScheme name="Company line scheme">
  <lnfillmarker>
    <lnRef name="Solid 18"/>
    <linefillRef name="accent1"/>
    <markerRef name="No Marker"/>
  </lnfillmarker>
  ...
</lnfillmarkerScheme>
```

lnfillmarker. A combined line style for line charts (see Line chart on page 39) described by the child elements `lnRef`, `linefillRef`, and optionally `markerRef` referencing a line, a fill color, and a marker respectively.

Example:

```
<lnfillmarker>
  <lnRef name="Solid 18"/>
  <linefillRef name="accent1"/>
  <markerRef name="No Marker"/>
</lnfillmarker>
```

lnRef. A reference to a line defined in the `lnLst` element. The attribute `name` must match the value of the same attribute in the line definition. `lnRef` as a child element of `lnfillmarker` has the following restrictions: It may not reference the `noLine` line type and as MS Graph supports only the following four line weights in a line chart, please reference lines with a width listed below. Other values will be rounded to their nearest supported neighbor.

Supported line weights in line charts:

line weight in	
EMU	pt
3175	0.25
9525	0.75
19050	1.5
28575	2.25

Example:

```
<lnRef name="Solid 18"/>
```

linefillRef. A reference to a fill color defined in the `fillLst` element. The attribute `name` must match the value of the same attribute in the fill definition.

Example:

```
<linefillRef name="accent1"/>
```

markerRef. A reference to a marker defined in the `markerLst` element. The attribute `name` must match the value of the same attribute in the marker definition.

Example:

```
<markerRef name="No Marker"/>
```

Choices in the marker scheme control

fillmarkerSchemeLst. A list of think-cell marker schemes that will be used in the marker scheme control of the floating toolbar (see Marker scheme on page 22). Individual marker schemes are defined using the `fillmarkerScheme` child element.

Example:

```
<fillmarkerSchemeLst>
  <fillmarkerScheme name="Company marker scheme">
  ...
</fillmarkerSchemeLst>
```

fillmarkerScheme. A marker scheme consisting of a sequence of markers. It is defined by referencing markers using the child element `fillmarker`. The attribute `name` contains the name that is used in the color scheme control.

Example:

```
<fillmarkerScheme name="Company marker scheme">
  <fillmarker>
  ...
</fillScheme>
```

fillmarker. A combined marker style consisting of a marker reference using the child element `markerRef` and an optional fill color reference using the child element `solidfillRef`. If `markerRef` references `noMarker`, `solidfillRef` will be ignored.

Example:

```
<fillmarker>
  <markerRef name="Square"/>
  <solidfillRef name="Orange"/>
</fillmarker>
```

Customizing charts

fillSchemeRefDefault

A reference to a fill scheme that is used as the default color scheme for all chart types. If one or several of the elements

```
fillSchemeRefDefaultStacked,
fillSchemeRefDefaultWaterfall,
fillSchemeRefDefaultClustered,
fillSchemeRefDefaultMekko,
fillSchemeRefDefaultArea,
fillSchemeRefDefaultPie,
fillSchemeRefDefaultBubble
```

are used, they override the default scheme set here for the corresponding specific chart type. If all of these elements are used, the `fillSchemeRefDefault` may be omitted.

Example:

```
<fillSchemeRefDefault name="Company scheme"/>
```

fillSchemeRefDefaultStacked

The default color scheme for stacked charts.

Example:

```
<fillSchemeRefDefaultStacked name="Stacked scheme"/>
```

fillSchemeRefDefaultWaterfall

The default color scheme for waterfall charts.

Example:

```
<fillSchemeRefDefaultWaterfall
  name="Waterfall scheme"/>
```

fillSchemeRefDefaultClustered

The default color scheme for clustered charts.

Example:

```
<fillSchemeRefDefaultClustered
  name="Clustered scheme"/>
```

fillSchemeRefDefaultMekko

The default color scheme for mekko charts.

Example:

```
<fillSchemeRefDefaultMekko name="Mekko scheme"/>
```

fillSchemeRefDefaultArea

The default color scheme for area charts.

Example:

```
<fillSchemeRefDefaultArea name="Area scheme"/>
```

fillSchemeRefDefaultPie

The default color scheme for pie charts.

Example:

```
<fillSchemeRefDefaultPie name="Pie scheme"/>
```

fillSchemeRefDefaultBubble

The default color scheme for bubble charts.

Example:

```
<fillSchemeRefDefaultBubble name="Bubble scheme"/>
```

lnfillmarkerSchemeRefDefault

The default color scheme for line charts.

Example:

```
<lnfillmarkerSchemeRefDefault name="Line scheme"/>
```

lnfillmarkerSchemeRefDefaultCombination

The default color scheme for combination charts.

Example:

```
<lnfillmarkerSchemeRefDefaultCombination
  name="Combination scheme"/>
```

Customizing lines

lnfillDefault

The default line type used throughout think-cell. Using a `lnRef` element to reference one of the lines in the `lnLst` element the dash type and weight is defined. One of the solid colors in the `fillLst` element is referenced using `solidfillRef` to set the color.

Example:

```
<lnfillDefault>
  <lnRef name="Solid 0.75 pt" />
  <solidfillRef name="tx1" />
</lnfillDefault>
```

If either the `lnRef` or the `solidfillRef` element is missing from one of the line style definitions below, the respective value from `lnfillDefault` is used.

lnfillGridline. The grid line style.

Segment outlines

The outlines of segments are defined on the fill scheme level, i.e., every scheme from the color scheme control can also set a line style for segment outlines. The following elements are therefore child elements of a `fillScheme` element.

lnfillSegment. The default outline style for this color scheme.

lnfillSegmentMekko. The outline style for Mekko charts using the parent element's color scheme. If omitted, the line style from `lnfillSegment` is used.

Example. Here, `noLine` is used for segment outlines. However, as this is often not appropriate for Mekko charts, these use a thin solid line with the standard foreground color.

```
<fillScheme name="PowerPoint Theme" ...>
  <lnfillSegment>
    <noLine/>
  </lnfillSegment>
  <lnfillSegmentMekko>
    <lnRef name="Solid 0.25 pt" />
    <solidfillRef name="tx1" />
  </lnfillSegmentMekko>
```

```
  <fillRef name="accent1"/>
  ...
</fillScheme>
```

Lines in charts

The following elements are child elements of the element `chart`.

lnfillAxis. The default chart axis line style.

lnfillAxisCategory. The category axis line style. Can be used to set a thicker baseline weight. If omitted, `lnfillAxis` is used.

lnfillArrow. The default line style used for difference arrows.

lnfillArrowCAGR. The line style used for CAGR arrows.

lnfillArrowCategoryDifference. The line style used for category difference arrows.

lnfillArrowSegmentDifference. The line style used for segment difference arrows.

lnfillExtensionLine. The line style used for extension lines of segment difference arrows.

lnfillConnector. The line style used for connector lines.

lnfillValueLine. The line style used for value lines.

lnfillTrendLine. The line style used for trend lines.

lnfillPartition. The line style used for partitions.

lnfillErrorBar. The line style used for error bars.

Lines in the legend

The following element is a child element of the element `legend`.

lnfill. The legend outline.

Example:

```
<legend>
  <lnfill>
    <lnRef name="Solid 0.75 pt" />
    <solidfillRef name="Dark Gray" />
  </lnfill>
</legend>
```

Lines in connection with labels

The following elements are child elements of the element `label`.

lnfillLeaderLine. The line style used for the line between a segment label and the segment when the label is not placed inside the segment. If `solidfillRef` is not specified, instead of using the color from `lnfillDefault`, think-cell uses the color matching the automatically set label font color.

lnfillBubble. The line style used for the outline of difference arrow labels.

Customizing Harvey ball and checkbox

harveyball

A combined style for the Harvey ball consisting of the child elements `fillRefCompleted` and `fillRefBackground` to describe the color of the completion state and the background color of the Harvey ball respectively.

Example:

```
<harveyball>
  <fillRefCompleted name="Black"/>
  <fillRefBackground name="White"/>
</harveyball>
```

fillRefCompleted

See `fillRef`.

fillRefBackground

See `fillRef`.

checkbox

A combined style for the Checkbox consisting of the child element `fillRef` to describe the background color of the Checkbox, the child element `lnfill` to describe the Checkbox's outline and the list of symbols, characters and pictures in the child element `choices`.

Example:

```
<checkbox>
  <fillRef name="Light Gray"/>
  <lnfill>
    <noLine/>
  </lnfill>
  <choices>
    <glyph hotkeys="xX2">
      <solidfillRef name="Pink"/>
      <font typeface="Arial Unicode MS"/>
      <t>&#10007;</t>
    </glyph>
    <glyph hotkeys="qQ3">
    <font typeface="Arial Unicode MS"/>
    <t>?</t>
    </glyph>
    <pic hotkeys="uU4">
      <Relationship Target="up.emf"/>
    </pic>
    <pic hotkeys="dD5">
      <Relationship Target="down.emf"/>
    </pic>
    <glyph hotkeys=" 0">
    <t> </t>
    </glyph>
  </choices>
</checkbox>
```

choices

A list of choices to be used in a checkbox. The list can contain any number of the elements `glyph` for characters and symbols and `pic` for pictures.

glyph

A glyph (character or symbol) that is used as one of the choices of a checkbox. The attribute `hotkeys` describes a list of hotkey characters that select the glyph. The child elements `solidFillRef` describes the color of the character or symbol, `font` its font and `t` the character or symbol itself.

Example:

```
<glyph hotkeys="qQ3">
  <solidfillRef name="Blue"/>
  <font typeface="Arial Unicode MS"/>
  <t>?</t>
</glyph>
```

t

A character or symbol used in a glyph (itself used in a checkbox). The contents of this element can be a verbatim character (`a`), a Unicode symbol or a numeric character reference to a Unicode code point. The numeric reference can be given using decimal numbers (`✗`) or hexadecimal numbers (`✗`).

pic

A picture that is used as one of the choices of a checkbox. The file name of an EMF file with the picture is given as the attribute `Target` of the child element `Relationship`. The attribute `hotkeys` describes a list of hotkey characters that select the picture.

Example:

```
<pic hotkeys="dD5">
  <Relationship Target="down.emf"/>
</pic>
```

E. Programming think-cell

Some functions of think-cell can be accessed programmatically. The interface is integrated into the Office Automation model, so it can be accessed from any language with which you can program Office, such as Visual Basic for Applications or C#.

The entry point into think-cell is the think-cell add-in object. It can be accessed via the `Application.COMAddIns` collection. Calls into think-cell are always late-bound. See Microsoft's knowledge base for an explanation:

http://support.microsoft.com/kb/245115

Thus, the type of the think-cell add-in object is simply `Object`, and there is no type library or reference to add. Just acquire the object, and you are ready to make calls:

```
Dim tcaddin As Object
Set tcaddin = _
    Application.COMAddIns("thinkcell.addin").Object
```

The following sections describe the available functionality.

UpdateChart

UpdateChart Name property control

Available in the floating toolbar for a chart (see Formatting and style on page 19), you can set an arbitrary, unique name to identify the chart when calling the function `UpdateChart` to update the data for the chart.

Signature

```
tcaddin.UpdateChart( _
    pres As PowerPoint.Presentation, _
    strName As String, _
    rgData As Excel.Range, _
    bTransposed As Boolean _
)
```

Description

This function updates the chart `strName` in `pres` with the numbers contained in `rgData`. The range `rgData` must conform to the layout described in Creating a chart from Excel on page 90.

The chart name `strName` is matched case-insensitive. It must have been previously assigned in PowerPoint using the **UpdateChart Name** property control described above.

If the chart is linked to any Excel data range when invoking this funtion the link is broken. Afterwards the chart will not be linked to any Excel range.

Example

To use this sample, in Excel's Visual Basic for Applications window, go to **Tools**, then **References** and add the Microsoft PowerPoint Object Library.

```
' When Option Explicit appears in a file, you must
' explicitly declare all variables using the Dim
' or ReDim statements. If you attempt to use an
' undeclared variable name, an error occurs at
' compile time.
' Use Option Explicit to avoid incorrectly typing
' the name of an existing variable or to avoid
' confusion in code where the scope of the
' variable is not clear. If you do not use the
' Option Explicit statement, all undeclared
' variables are of Object type.
' http://msdn.microsoft.com/en-us/
' library/y9341s4f%28v=vs.80%29.aspx
Option Explicit

Sub UpdateChart_Sample()

   ' Get the range containing the new data
   Dim rng As Excel.Range
   Set rng = _
    ActiveWorkbook.Sheets("Sheet1").Range("A1:D5")

   ' Get the think-cell add-in object
   Dim tcaddin As Object
   Set tcaddin = _
    Application.COMAddIns("thinkcell.addin").Object

   ' Get a PowerPoint instance. Hold on to this
   ' object as long as you want to access the
   ' generated presentations. There can only be a
   ' single PowerPoint instance. If there is no
   ' PowerPoint running, one will be started.
   ' Otherwise the existing one is used.
   Dim ppapp As Object
   Set ppapp = New PowerPoint.Application

   Dim pres As PowerPoint.Presentation

   ' PowerPoint window visible
   ' Set pres = ppapp.Presentations.Open( _
   '  Filename:="c:\\example.pptx", Untitled:=msoTrue)

   ' PowerPoint window invisible
   Set pres = ppapp.Presentations.Open( _
    Filename:="c:\\example.pptx", Untitled:=msoTrue, _
    WithWindow:=msoFalse)

   ' The name "No1" must have been
   ' previously assigned to the chart using
   ' the control in the floating toolbar.
   ' The final argument indicates whether
   ' the data range is transposed or not.
   Call tcaddin.UpdateChart(pres, "No1", rng, False)

   ' Save the updated presentation
   pres.SaveAs ("c:\\example_updated.pptx")
   pres.Close

   ppapp.Quit
End Sub
```

```
using Excel = Microsoft.Office.Interop.Excel;
using PowerPoint = Microsoft.Office.Interop.PowerPoint;
using Office = Microsoft.Office.Core;
// Open the Solution Explorer > right-click the project file > "Add Reference..." button and add he following references:
// .NET tab > Microsoft.Office.Interop.Excel 12.0.0.0
// .NET tab > Microsoft.Office.Interop.PowerPoint 12.0.0.0
// COM tab  > Microsoft Office 14.0 Object Library
namespace ConsoleApplication_UpdateChart
{
  class Program
  {
    static void Main()
    {
      Excel.Application xlapp = new Excel.Application();
      xlapp.Visible = true;

      Excel.Workbook workbook = xlapp.Workbooks.Add(1);
      Excel.Worksheet worksheet = (Excel.Worksheet)workbook.Sheets[1];
      worksheet.Cells[3, 1] = "Series 1";
      worksheet.Cells[3, 2] = 1;
      worksheet.Cells[3, 3] = 2;
      worksheet.Cells[3, 4] = 3;

      PowerPoint.Application ppapp = new PowerPoint.Application();
      PowerPoint.Presentation presentation =
        ppapp.Presentations.Open("C://test.pptx", Office.MsoTriState.msoFalse, Office.MsoTriState.msoTrue);

      object[] aobjArg = new object[] { (object)presentation, "ChartNo1", worksheet.get_Range("A1", "D3"), false };

      Office.COMAddIn comaddin = xlapp.COMAddIns.Item("thinkcell.addin");
      object objAddIn = comaddin.Object;
      objAddIn.GetType().InvokeMember("UpdateChart", System.Reflection.BindingFlags.InvokeMethod, null, objAddIn, aobjArg);

      presentation.SaveAs("C://test_updated.pptx");
      presentation.Close();
      ppapp.Quit();

      workbook.Close(false);
      xlapp.Quit();
    }
  }
}
```

Figure E.1 `UpdateChart` example in C#

PresentationFromTemplate

Signature

```
tcaddin.PresentationFromTemplate( _
    wb As Excel.Workbook, _
    strTemplate As String, _
    ppapp As PowerPoint.Application _
) As PowerPoint.Presentation
```

Description

This function applies any data links in `wb` to the template with filename `strTemplate`. The result is a new presentation within the PowerPoint instance `ppapp`.

`strTemplate` can either be a full path or a relative path, which is then taken to be relative to the location of the Excel workbook file `wb`.

All charts in `strTemplate` that are linked to the Excel workbook `wb` are updated (regardless whether they are set to auto-update or not). Then their data links are broken to prevent further changes to these charts.

Charts in `strTemplate` which are linked to Excel workbooks other than `wb` are left unchanged and still linked, so it is possible to update links from multiple Excel workbooks by saving the result of this function as a new template and then calling this function again with the next workbook.

If you want to control the colors of chart segments with the Excel link, you can set the color scheme to **Use Excel Fill** (see Color scheme on page 20). Likewise, to control the number format with the Excel link, set it to **Excel Format** (see Number format on page 35). Make sure to set the background color and the number format of the respective cells in Excel before calling `PresentationFromTemplate`.

Example

To use this sample, in Excel's Visual Basic for Applications window, go to **Tools**, then **References** and add the Microsoft PowerPoint Object Library.

```
' When Option Explicit appears in a file, you must
' explicitly declare all variables using the Dim
' or ReDim statements. If you attempt to use an
' undeclared variable name, an error occurs at
' compile time.
' Use Option Explicit to avoid incorrectly typing
' the name of an existing variable or to avoid
' confusion in code where the scope of the
' variable is not clear. If you do not use the
' Option Explicit statement, all undeclared
' variables are of Object type.
' http://msdn.microsoft.com/en-us/
' library/y9341s4f%28v=vs.80%29.aspx
Option Explicit

Sub PresentationFromTemplate_Sample()
    ' Get the range to modify. It is more efficient
    ' to do this once rather than within the loop.
    Dim rng As Excel.Range
    Set rng = _
     ActiveWorkbook.Sheets("Sheet1").Cells(3, 2)

    ' Get the think-cell add-in object
    Dim tcaddin As Object
    Set tcaddin = _
     Application.COMAddIns("thinkcell.addin").Object

    ' Get a PowerPoint instance. Hold on to this
    ' object as long as you want to access the
    ' generated presentations. There can only be a
    ' single PowerPoint instance. If there is no
    ' PowerPoint running, one will be started.
    ' Otherwise the existing one is used.
    Dim ppapp As Object
    Set ppapp = New PowerPoint.Application

    Dim i As Integer
    For i = 1 To 10
        ' Modify the range value.
        ' Note: Avoid selecting the cell prior to
```

```
      ' changing it. It is very slow and has
      ' undesirable side-effects.
      ' BAD:
      ' rng.Select
      ' ActiveWindow.Selection.Value = 0
      rng.Value = i

      ' Generate a new presentation based on the
      ' linked template.
      Dim pres As PowerPoint.Presentation
      Set pres = tcaddin.PresentationFromTemplate( _
       Excel.ActiveWorkbook, "template.pptx", ppapp)

      ' If you want to modify the new presentation
      ' before saving it this is the place to do it.

      ' Save the new presentation
      pres.SaveAs "c:\\output" & i & ".pptx"

      ' Explicitly close the presentation when we
      ' are done with it to free its memory.
      ' Letting the object go out of scope is not
      ' sufficient.
      pres.Close
   Next
End Sub
```

F. Keyboard shortcuts

Most keyboard shortcuts that you know from PowerPoint work with elements as well. The same is true for keys that modify mouse operations like Shift ⇧-click for additive selection and Ctrl-drag for duplication of shapes.

The following table shows the keyboard shortcuts frequently used with think-cell, and the ones that offer additional functionality over Microsoft PowerPoint.

Shortcut key	Description
F2	Toggle text-edit mode in text labels
Delete or ⟵	– Delete the selected element – Remove the selected feature (e.g., label)
Alt+ ← → ↑ ↓	– Move focus across shapes on the slide – Move focus across features (e.g., labels) of an element
Alt+Insert	Gantt chart only: Insert new activity
V, X	Checkbox only: set state
0 1 2 3 4	Harvey ball only: set state
Alt+↵	In Excel datasheet: line break
F7	In Excel datasheet: spell checking
Middle mouse button: click and drag	In zoom view: Grab the slide and pan it around
Alt+Shift ⇧+Page up Page down	Align text inside text boxes up or down

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